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# NATIONAL ASSOCIATION
OF
# COST ACCOUNTANTS

## YEAR BOOK
## 1931

PROCEEDINGS OF THE
TWELFTH INTERNATIONAL COST CONFERENCE

William Penn Hotel
Pittsburgh, Pennsylvania
June 15, 16, 17, 18, 1931

1790 BROADWAY, NEW YORK CITY

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# SESSION I

# STANDARD COSTS FOR THE NACA MANUFACTURING COMPANY

TUESDAY MORNING, JUNE 16, 1931

---

Presiding Officer at all sessions, C. C. JAMES, Consulting Accountant, New York City, who acted as President of the Naca Manufacturing Company.

PROGRAM COMMITTEE

F. RICHMOND FLETCHER, Partner, *Scovell, Wellington & Company,* Boston, Massachusetts, Chairman.
C. C. JAMES, Consulting Accountant, New York City.
GRANT R. LOHNES, Treasurer and Controller, *National Cash Register Company,* Dayton, Ohio

CHARLES REITELL was graduated from the Wharton School of Commerce of the University of Pennsylvania in 1910. Following his graduation, he entered the employ of the Pennsylvania Steel Company as Cost Accountant. Following two years in industry, he entered the teaching field as Professor of Economics at Elmira College. In 1915, he received his Master's Degree at the University of Wisconsin and spent the war years 1915-1919 with the Bureau of Standards and the War Department. During this period, in 1917, he received his Ph.D. Degree at Pennsylvania. Following his Government Service, he became Professor of Accounting and Industry at the University of Pittsburgh and in 1923 entered the service of the State of Pennsylvania as Director of Accounts. In 1925, he returned to the University of Pittsburgh and is now the head of the Department of Accounting and Industry at that institution. He was recently appointed Chairman of Governor Pinchot's Greater Pennsylvania Council, an organization devoted exclusively to the promotion of development within the state of Pennsylvania. During his teaching career, he has carried on professional work in the accounting and management field and has written a large number of books and articles on accounting in business subjects. He is the co-author of the recent book COST ACCOUNTING FOR ENGINEERS. At the 1931 Convention he was elected to membership on our national board of directors and has served our Pittsburgh Chapter as President. He has delivered his papers before a large number of other chapters.

# STANDARD COSTS FOR THE NACA MANUFACTURING COMPANY

The opening session of the Twelfth International Cost Conference of the National Association of Cost Accountants, held at the William Penn Hotel, Pittsburgh, Pennsylvania, convened at nine-fifty o'clock, Tuesday, June 16, 1931, with Mr. V. W. Collins, Assistant Controller, General Cable Corporation, Rome, N. Y., President of the Association, presiding.

PRESIDENT COLLINS: I deem it a great privilege and honor to be permitted to appear before you this morning as your President and to extend to you an official welcome to this, our twelfth annual conference. But it is a privilege and an honor deeply tinged with sadness because, through an act of fate, I stand in the place of him whom we all expected would preside at this conference. And to him, Walter S. Gee, our late and beloved President, who was taken from us at the height of his career, I should like at this time to pay a sincere tribute of respect. To those of us who knew him well, such a tribute is unnecessary, I know, but I cannot refrain at this time from asking you to join me in such a tribute to one so deserving.

He served this Association of ours loyally and faithfully since its organization, October 1919. He held office continuously with the exception of one year. In his quiet, unassuming, patient and straightforward manner, he contributed unselfishly to the growth and development that we have enjoyed. May his strength of character and ideals inspire us all to carry on.

May I ask at this time that you rise and pay silent tribute to his memory?

. . . The audience arose during the sounding of taps. . . .

In accepting the presidency of this Association, I did so with a great sense of responsibility, being ever mindful of the task ahead, and I assure you I have endeavored, so far as possible, to

carry on as I felt Walter Gee would have liked to carry on. This thought, together with my feeling of a deep sense of gratitude that I owe to our Association, is the thing that actuated me in accepting, for I shall always feel that no matter what the task might be, it will never be too great for me to perform, if humanly possible, to repay my sense of obligation to the N.A.C.A.

In spite of the handicaps we have had, the change in administration and the general business conditions so prevalent, we have made a splendid record of progress and are running ahead of all previous years, in all the activities of the Association.

In conclusion, I should like to express my deep personal gratitude to those good friends of mine on the national board who honored me so highly by choosing me to fill this vacancy and who demonstrated their loyalty and friendship by standing by, supporting and assisting me in every possible way to carry on the difficult task which I have undertaken. I realize how far short our best efforts have fallen, but I am sure you all appreciate that we have endeavored to do the very best we could under these trying circumstances. I have had a most sympathetic understanding and support not only from our national board, but from every chapter of the Association.

I am sorry that it was not possible for me to visit more chapters during these past few months. I had laid out for myself a rather elaborate schedule, but I was compelled, through business obligations, to abandon the latter part of it. I still feel that my administration leaves me deeply indebted to our Association for what it has done for me in my personal development and for the high honor it has paid me in electing me to this office. I shall always be willing and glad to do whatever I can to repay all that has been given to me.

We will now turn to the important part of our conference, our technical sessions. These sessions this year have, as you know, been developed around the central theme of profit-making management. In developing this theme, your convention program committee built the sessions upon case studies of actual conditions in operating industrial plants and I should like at this time to express our appreciation to the officers of these companies for their cooperation. On the basis of these studies, an hypothetical company has been developed which has been named the Naca Manufacturing Company, manufacturing a line of bolts and nuts. For the next

three days we shall study the affairs of this company with a view to the steps which must be taken in order to re-establish it on a profit-making basis.

Obviously, under these conditions, figures that are used cannot be taken too seriously. The platform speakers, who take the roles of the respective executives of the Naca Manufacturing Company, have been drawn from diversified lines of activity and from widely separated geographical points. It has been impossible consequently for them to dovetail precisely the figures that have been employed in our illustrations.

The major objective of this week's program is to expound principles, and if this is done effectively, I feel that we will all have been amply repaid for our attendance and for the attention we hope all will vouchsafe.

We shall now, by way of introduction, give you a look into the internal affairs of the Naca Manufacturing Company which will indicate some of the problems with which the president of this company has been struggling in the past.

# THE PRESIDENT'S DESPAIR

BY

CHESTER M. WALLACE

CARNEGIE INSTITUTE OF TECHNOLOGY
PITTSBURGH, PA.

A Playlet in One Scene Presented at the
Twelfth International Cost Conference
of the
National Association of Cost Accountants

William Penn Hotel
Pittsburgh, Pa.
June 16, 1931

## CAST OF CHARACTERS

(*As they will appear*)

*The President*.....MR. CHARLES C. JAMES
*His Secretary*.....MISS POLLY BAUERSMITH
*The Cost Accountant*.....MR. CHARLES REITELL

*Time*—December, 1930.

*Place*—Office of the President of the Naca Manufacturing Company, Pittsburgh, Pa.

## THE PRESIDENT'S DESPAIR

*Scene*—Office of the President. Door from Corridor C. Door R. Desks C. and R. At the rise of the curtain, the president is dictating to his private secretary.

*President*

And unless something unforeseen happens, I intend to go through with it. Very truly yours. That's all. (Turns to his work. Secretary starts to leave, hesitates. Stops at L.)

*Secretary*

Excuse me, Mr. James. Perhaps I have no right to speak, but you simply can't go through with this.

*President*

Can't go through with what?

*Secretary*

Your resignation. You musn't insist on the company accepting it.

*President*

The Board of Directors refused to accept it yesterday. They want me to reconsider, but I still say, "Let them get a new president".

*Secretary*

Then I've been working all these years for a quitter.

*President*

No, I'm not a quitter, and you know it. But the company's running behind.

*Secretary*

Why?

*President*

Oh, I don't know. Things are all mixed up, and I can't get them straightened out, so it's time I resigned. Here's just one case. (Lifts papers) Take our costs on ¾ by 6, ¾ by 8, and ¾ by 10 inch machine bolts. The six inch show a cost of $4.03 per thousand. The 8 inch, $5.62 per thousand, and the 10 inch, $4.84 per thousand. The six and eights are made automatically and the tens are hand fed, but according to these costs, the eights cost more than the tens.

*Secretary*

If I were you, the first thing I'd do would be to have a good straight talk with the cost man.

*President*

Oh, what does the cost man know about it? He just sits out there and puts down a lot of figures. He submits all these graphs and curves, (indicating them), and what good are they? I know all about these cost men.

*Secretary*

Are you sure you know all about Mr. Reitell?

*President*

You don't mean young Charlie Reitell?

*Secretary*

Yes I do. He's not like an ordinary cost man. He's up and coming. He's been going to night school at the University of Pittsburgh, and he never misses the local meetings of the National Association of Cost Accountants, and he knows everyone of their bulletins by heart.

*President*

Is that so? Sounds like he was interested in his job.

*Secretary*

He is interested in his job. Please, Mr. James, let me call him in.

*President*

Hello! He may be interested in his job, but it looks to me as if you were interested in him. Are you?

*Secretary*

Why, Mr. James!

*President*

Come on, 'fess up. I know that look. Are you?

*Secretary*

Well, maybe.

*President*

So that's why you're trying to cram Reitell down my throat!

*Secretary*

No, Mr. James. It isn't. I do like him. In fact, I like him very much. But aside from that, I want you to see him because I believe his ideas will help you.

*President*

All right, Miss Bauersmith. I've known you for a good many years, and I've never known you to back a loser, so I'll take your word for it and see him.

*Secretary*

Thank you, Mr. James. (In phone) Mr. Reitell, please.

*President*

(Leaving) I want to go in and speak to Adams a minute. (goes out R.)

*Secretary*

I'll have Mr. Reitell here when you get back. (In phone on desk C) Hello, Charley. Do you know who this is? Never mind, this is business. Mr. James wants to see you right away—maybe—he looked awfully black—all right. (hangs up receiver) Hums song, "'Round her neck She Wore a Yellow Ribbon," powders nose, and keeps smiling, watching the door. When she hears him outside she hurries to President's chair.)

*Cost Accountant*

(Bursts in) Hello, Polly. What's up?

*Secretary* (sternly)

I don't know.

*Cost Accountant*

Am I going to get canned?

*Secretary*

I haven't the least idea.

*Cost Accountant*

Oh, you haven't. Don't you care at all? Why didn't you speak a good word for me?

*Secretary*

Why should I bother to speak a good word for you?

*Cost Accountant*

Well, I'll be damned! You women are all alike.

*Secretary* (laughing)

Can't you take a joke? No, you're not going to be fired. I've persuaded Mr. James to give you an interview. Now's your chance to put over those standard cost ideas you're always talking about. He's in a hole, and if your ideas'll work here's your chance to pull him out and put yourself over.

*Cost Accountant*

Polly, do you mean it? If I put myself over with him, will you give me a favorable answer to the little proposition I made to you the other night?

*Secretary*

I'm not making any promises until you've made good.

*Cost Accountant*

Oh, I'll make good, all right, and if I do your answer will be 'yes', won't it?

*Secretary*

Well maybe. I'm getting a little tired of this job.

*Cost Accountant* (rushing toward her)

Polly!

*Secretary* (stopping him)

No, you make good first.

*Cost Accountant*

Oh, I'll make good and I'm going out today and buy the ring. (door opens)

*Secretary*

Sh! Sh! (she goes upstage) Here's Mr. Reitell, Mr. James.

*President*

Hello, Charley. Sit down. (Reitell sits L of C desk) I'm glad to see you. Somebody (looking at Polly) don't remember just who it was, told me you had been making quite a study on costs. (Secretary sits at desk L).

*Cost Accountant*

I have, Mr. James. If this concern is ever to make any money, we must have a much improved cost system. One which will embrace standard costs.

*President*

Standard costs! I suppose that'll mean we put in a new force—a great big expensive staff.

*Cost Accountant*

No, Mr. James, it doesn't require a large staff. It can be done with one additional clerk, and after the system is running smoothly, I think we can dispense with him.

*President*

That's fair enough, but how does your cost system work? For instance, would it clear up this mix-up over the machine bolts? I have your note on that, and I don't understand it. You say the ¾ by 6 inch show a cost of $4.03 per thousand, and the 8 inch, $5.62 per thousand; the 10 inch, $4.84 per thousand; while we know that the 6 and 8 inch lengths are made automatically, and the 10 inch is hand fed. According to these costs, the 10 inch show a lower cost than the 8. Just why is this? You must have the figures twisted.

*Cost Accountant*

No, Mr. James, the figures are absolutely correct.

*President*

How could the 8 inch bolts cost more than the 10? What did the last run of 8 inch cost?

*Cost Accountant*

$4.38 a thousand.

*President*

(Whistles in dismay) Something is rotten in the state of Denmark. You say this last lot cost $5.62 a thousand, and the previous lot cost only $4.38. Your figures must be wrong.

*Cost Accountant*

Some of the extra cost is in the material. You see, we recently had quite a run on the 8 inch size, and our stock of steel got down low because we had

been buying pretty close to immediate requirements. We couldn't wait for a mill shipment, so the purchasing department bought ten tons of rods from Carnegie Steel Company's local warehouse. They charged us their regular warehouse price, which was $1.30 a hundred pounds more than the mill price. This accounts for 48c a thousand of the extra cost over the last run.

This steel, of course, was in stock size, so we had extra waste in short cuts, which we had to sell as scrap. This accounted for 2c per thousand of the extra cost.

Another thing, we had rather poor luck in threading. We had over 90 defectives which we had to scrap, while on the run before, we had only 19.

Then I found that we had to run this last lot on hand fed machines instead of the No. 3 Automatic. This made our direct labor cost somewhat higher and production slower.

*President*

(Leans back in chair and looks helpless) I followed you for a while, but now I am completely lost. What you have told doesn't account for half of this difference of $1.24 a thousand in the cost of the two lots.

*Cost Accountant*

The rest is overhead. We revised our overhead rates the first of the year. We are using 189% now, which was the average of the last quarter of 1930, when our production was 'way down. The previous run was figured at the old rate of 164%. And last spring, when we were running about the same as we are now, we got down below 125%.

*President*

No wonder we weren't making any money. We can't quote prices on costs that are up when they ought to be down, and down when they ought to be up. How much business do you think we can get on such a basis?

*Cost Accountant*

These bolts are only one example of the whole bad situation, and they show why up-to-date companies are putting in standard costs and other things that go with them—planning, and control, time studies, market analysis, sales quotas, budgets and financial forecasts. I'd just like to have an opportunity to lay the whole plan before you, Mr. James.

*President*

Well, we must do something to begin to turn in a profit around here, or we'll have to shut up shop. I'm going to give you a chance. Go ahead and see what you can work out, and when you think you have got something that I can understand, bring it in and show it to me.

*Cost Accountant*

Thank you, Mr. James, I'll do it.

*President*

That's fine, and I hope you make good.

*Cost Accountant*

Oh, I'll make good all right. There's too much at stake for me to lose.

*President*

What do you mean, "too much at stake"?

*Cost Accountant* (at door)

Ask Miss Bauersmith. (exit).

President turns to Polly. Polly blushes.

QUICK CURTAIN

## BOARD OF DIRECTORS MEETING—JUNE 16, 1931

V. W. COLLINS, (*Chairman of the Board, Naca Manufacturing Company*): The meeting will please come to order. The secretary will read the minutes of the previous meeting.

W. MASON SMITH, (*Secretary, Naca Manufacturing Company*): The regular semi-annual meeting of the board of directors of the Naca Manufacturing Company was held at the office of the company at 118 Grant Street in the city of Pittsburgh on the fifteenth day of December, 1930, at which a majority of all regularly elected directors was in attendance.

The chairman of the board presided and called the meeting to order. The minutes of the previous semi-annual meeting were read and approved.

Nominations for corporate officers to serve for the year 1931 and until their successors shall have been chosen and qualified were submitted by Colonel A. H. Carter, chairman of the nominating committee, as follows:

| | |
|---|---|
| Chairman of the Board of Directors | —Val W. Collins |
| President | —Charles C. James |
| Vice-President and Treasurer | —W. O. Cutter |
| Secretary | —W. Mason Smith |

There being no further nominations, upon motion duly made, seconded, and carried, the secretary was directed to cast a ballot in favor of the officers named. The secretary having cast a ballot as directed, upon motion duly made and seconded, the following resolution was adopted:

RESOLVED: That the ballot be declared formal and the following named officers be declared elected to serve until their successors shall have been elected and qualified:

| | |
|---|---|
| Chairman of the Board of Directors | —Val W. Collins |
| President | —Charles C. James |
| Vice-President and Treasurer | —W. O. Cutter |
| Secretary | —W. Mason Smith |

At his own request the president, Mr. Charles C. James, was accorded recognition and stated that while he was grateful for the

renewed expression of confidence evidenced by his re-election, he did not feel that he should accept the presidency for another year because the results of the company's operations had been going from bad to worse in spite of his best efforts to handle the administration of its business affairs successfully. On approximately a million dollars of sales for 1930 there will be a net loss of over $50,000, which will wipe out the company's accumulated surplus and leave it for the first time in its thirty years of operation with a book value below the par value of its stock. Cash on hand is insufficient to meet current obligations for payrolls, and purchases of material. Bank loans have been continued and increased from time to time until they now aggregate $125,000, without any encouraging prospect for early reduction, so that no temporary increase would be justified to enable us to clear up our overdue accounts payable. The only way which appears open to accomplish this would be to discount our accounts receivable, an expedient which would doubtless have a very bad effect on our credit rating under present conditions. In view of the whole situation, Mr. James recommended that his resignation be accepted and that either the business be liquidated or that a new management with new capital be found to bring about a complete re-organization.

After a full discussion of the president's report, the following resolution was, upon motion, duly seconded and unanimously carried, Mr. James not voting:

WHEREAS, for many years the operations of the Naca Manufacturing Company were successfully administered under the direction of Mr. Charles C. James, its president and general manager; and

WHEREAS, its operations for the years 1928, 1929, and 1930 have been growing progressively less satisfactory to the extent that its financial position has been reduced to a point at which it is no longer possible to continue operations; so that either liquidation must be resorted to or new financing obtained:

THEREFORE, BE IT RESOLVED: That this board of directors express its continued confidence in the loyalty and ability of Mr. James, who is hereby authorized and directed to prepare and submit for the consideration of this board at its next meeting

to be held on June 16, 1931, a detailed plan for the re-organization and further financing of the company's affairs.

There being no further business, it was voted:

To adjourn.

W. Mason Smith, Secretary

Attest:
(Seal)

CHAIRMAN COLLINS: You have heard the reading of the minutes. Unless I hear objection they will stand approved as read. Hearing none, it is so ordered. As stated in the minutes of the previous meeting it was then the opinion of this board that if the management at this meeting could not lay before the board a definite program for an acceptable reorganization of this business the board should seriously consider its liquidation. Mr. James has prepared such a program and is here to present it to you. It seems appropriate to me in these circumstances that I should turn the meeting over to him to enable him to present what he has to say in orderly fashion. Mr. James.

CHARLES C. JAMES, (*President, Naca Manufacturing Company*): Thank you, Mr. Chairman. Six months ago, as you know, I was thoroughly discouraged. The affairs of our company had been going from bad to worse and I could not see my way clear to improve them. Just after that meeting our young cost accountant was in my office going over his cost figures with me and he suggested that what we needed here was a standard cost system based upon time studies, production planning and control, market analysis, sales quotas, overhead budgets, and financial forecasts. In desperation I authorized him to work out his ideas and submit them to me, and I promised him that if they were presented in such fashion that I could understand them I would give them favorable consideration. Ladies and gentlemen, he did a good job. His proposals have been gone over by all of our department heads including our controller, and we are all quite confident that they are the answer to our problem. The plan is entirely the work of our cost accountant. It is the child of his own brain and in fairness to him I believe he should have the privilege of presenting it to the board of directors. Therefore, with your permission, I should like to call in our cost accountant, Mr. Charles Reitell.

# THE STANDARD COST PLAN FOR THE NACA COMPANY

CHARLES REITELL

Director

Greater Pennsylvania Council, Harrisburg, Pa.

*Introduction*

In presenting this proposed plan of standard costs as a basis for the reorganization of your company, I wish to extend my heartiest thanks to President James for providing the opportunity for making a complete analysis and survey of our company and to my colleagues who have helped me at every turn.

I am urging the adoption of standard costs because I am thoroughly convinced that it will bring to Naca what we now so greatly lack—control over our operations, finances and profits, and coordination between our sales and production.

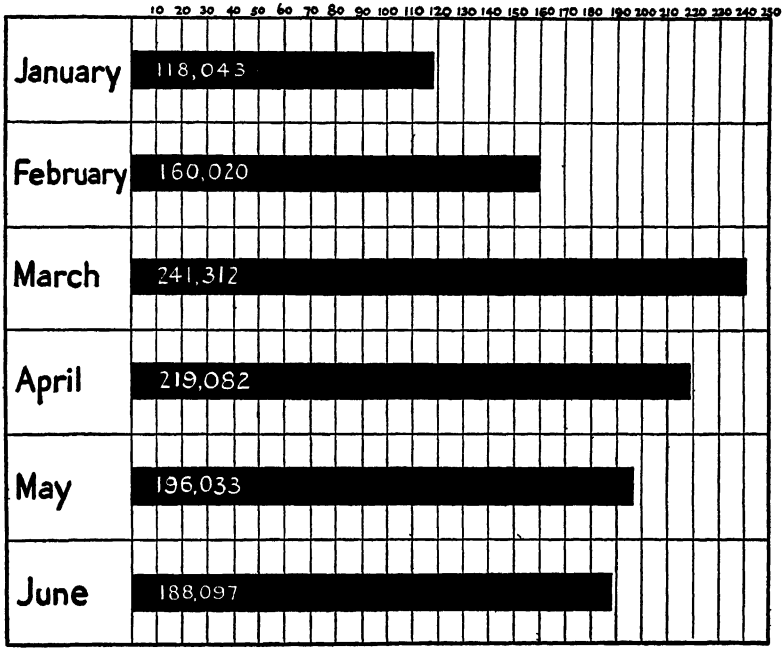
Through the kindness of many concerns which I have visited, I am able to present in a practical way their standard cost methods and excellent results obtained. After I have finished, representatives of several of these concerns will not only substantiate what I have to say but will develop for you other programs of improvement which nicely tie in with this standard cost system.

*Our Actual Costs Inadequate*

In attempting to explain the value of standard costs, let me start by showing how inadequate, misleading and futile is our present cost system. One illustration will suffice.

Figure one gives you the monthly punchings of our number eight automatic for six months. Note the difference in the monthly load, the highest run being more than double the lowest. Obviously, the overhead expense for each punching must vary greatly. As a second set of figures, consider the different rates of pay that are paid our punchers. The lowest is forty-five cents an hour, the highest fifty-eight cents. Between these extremes are punchers receiving forty-eight, forty-nine, fifty, fifty-three, fifty-five, and fifty-six cents an hour. If one run of orders happens in the highest production month with the lowest paid operator, the costs are low. In contrast, if the run is in a slack month with a high paid

puncher, the costs go very high. Between these high and low costs a thousand different combinations are possible. To place any confidence on such constantly varying conditions is obviously misleading. This is for punching. But what is true of this operation




Monthly Punchings ... Automatic No. 8

FIGURE 1

is duplicated in every other operation in the plant. I leave it to you whether any managerial or sales policies based upon such costs can ever be reliable! Such costs for Naca have proven worse than useless—they are dangerous and many of our major policies based upon them have brought us to a very sad day indeed.

*The Underlying Principles of Standard Costs*

Standard costs, in contrast to our present system, set forth a plan upon which we can place reliance for use in our marketing and sales divisions, and for our fiscal and plant officials.

*The underlying principle is to establish a standard cost for our product that represents the plant activities running at normal*

*volume, with the average rate of pay of each operation, with standard times for work to be performed and with material costs reflecting definite yields, and normal price conditions taken over a long time sweep.* Costs under such a plan reflect normal conditions. The thousand and one actual cost items that jump up and down, go hither and yon, are but detours or variances from our charted course. Such detours are reflected in detail as variances from the normal and by use of variance and follow-up sheets become the important bases upon which sound operating and administrative policies are built.

*The Advantages of Standard Costs:*

1. We will forecast market possibilities and establish quotas for our sales. This makes possible a coordination between our sales and our manufacturing. Such coordination also gives a sound basis for our purchasing of raw materials.

2. We will be enabled to budget and rigidly control our operating expenses. By setting specific budgets for overhead expense for different volumes of production, we will for the first time have *a rigid control over these expenses.* Heretofore our Cost Department simply distributed our overheads to different departments and costed them to products.

3. We will be able to effect a definite control over our service departments. Here the company has suffered severe losses. These departments must be placed under budgetary limitations: limitations adjusted to different volumes of business.

4. We will be enabled to measure the margin between our selling prices and our costs not only in total, but by lines of product as well.

*Standard Costs and Organization*

For our standard cost system to operate smoothly and effectively certain basic changes in our organization set-up are essential.

*Sound organization is a prerequisite to the successful operation of standard costs.* The first step to be taken therefore is to have our organization put right. And goodness knows, it needs it!

There are serious overlappings of responsibility. For instance, the management today finds it impossible to determine where the Engineering Department's responsibility ends and where the operating department's begin on matters of maintenance

and repairs. Like conflicts exist between our Stores Department and Purchasing Department; and the operating departments.

Our expense classification or operating code, as we call it, must be changed so that it will fit exactly into the definite organization set-up. It will then be possible to charge each and every supervisor from foreman to president with items of expense that are wholly, completely and entirely under his or her control. Each in turn will be held strictly responsible for these expenses which are his. And each will be placed under budgetary control to see that that responsibility is maintained.

*Standard Costs and Coordination*

Before taking up the specific steps for the installation of standard costs, I want to emphasize the close coordination that should exist between certain of the elements of our business at Naca.

They are:

(a) The annual net profit and the capital investment.
(b) Selling price and sales volume.
(c) Production and sales.
(d) Production and costs.

Let us take up each of these in turn.

(a) *The Annual Net Profit and the Capital Investment.*

The potential sales in a competitive field, such as ours, on the one hand, and the operating possibilities on the other, must be tied in with our financial requirements. *We can not hope to earn an adequate return on our investment until there is a complete coordination established among our potential sales, our operating activities, and our necessary return on our investment.* In order that we can pay the interest on our indebtedness and resume reasonable dividend payments on our capital stock, we must have an annual net profit of $100,000. How are we going to get it, when the net income for the past five years has been on a continual downward trend, except for the year 1929, when any plant could, and every plant did, make a profit? The first step is to determine our sales volume and selling prices.

(b) *Selling Prices and Sales Volume.*

In the past we have been sadly lacking in the set-up of a sales budget and in establishing sales quotas for our Sales Department. You are well aware of how we have attempted to market our

products during the lifetime of our company. We have attempted to increase our sales volume by giving the salesmen high-powered sales talks, by insisting that they go after customers with greater enthusiasm, by offering the salesmen increased commissions in the higher sales brackets, and by authorizing them to better competitors' prices when necessary to get the customer's signature on the sales order. These schemes have helped somewhat, but they are unintelligent and unscientific. *Our whole sales activity has moved along blindly, without thought of market analyses and sales quotas.* Sales quotas cannot be scientifically determined until a careful market analysis has been made of our potential market. This has been done by Mr. Dick, our sales manager, and myself during the hours of the long winter nights just passed.

With the market analysis complete, it was possible for Mr. Dick, as he will hereafter tell you more fully, to set our sales quotas and selling expenses for the coming year under the following classifications:

(1) Classification of sizes and items to be sold monthly together with the quantity of each size and item.
(2) Selling prices for different sizes and products.
(3) Total estimated income from sales for year and by months.
(4) Volume of sales assigned to each salesman.
(5) Volume of sales assigned to jobbers.
(6) Volume of sales from commission agents.
(7) Selling and advertising expenses for year and by month.

(c) *Production and Sales*

With the completed market analyses and the established sales quotas, Naca is, for the first time, coordinating production scheddules with forecasted sales. That, in itself, is certain to save the company considerable expense.

The carrying of heavy inventories, of raw materials, partly finished and finished goods, can be greatly reduced. The regularization of work and a greater stabilization of our plant are possible when our general manager knows what the production requirements are to be for three to six months in advance. This coordination of sales and production means that quarterly budgets can be established for every division of our plant. Our service departments in turn must adjust their budgets in keeping with the budgeted income, and thus prevent one of the most serious losses that has been

going on in this company for the last three or four years.

Furthermore, with the production schedules based upon our sales quotas, our Purchasing Department can establish material requirements ahead of time and thereby buy more economically and obtain better deliveries than at present.

(d) *Production and Costs*

By fundamental changes in the organization set-up mentioned before and by use of a new expense classification, it is now possible to charge every supervisor with such expenses as are under his control. Furthermore, specific budgets for each and every supervisor adjusted to different volumes are possible. By this means each supervisor becomes a manager. He will be held responsible not only for handling materials, machinery and men, but also the money values of these expenditures.

Each foreman thus will work under a specific budget covering the expenses of his operating center. For instance, Fred Appleton, foreman of the threaders, will have the following items under his responsibility: foreman, assistant foreman, inspectors, clerks, helpers, defective work, repairs, material handling, supplies, overtime bonus.

The general manager will likewise work under a budget covering such items as superintendents, rate setters, schedulers, route clerks, cranemen, fuel, light, police, stores expense and purchasing.

Each foreman also will be responsible in seeing that the direct labor in his operating or cost center meets the standard time set. By this procedure both overhead expense and direct labor are under definite control.

*Standard Cost Procedures*

In the setting up of standard cost procedures it is not necessary to inflict upon you all the accounting activities involved. It is sufficient to point out the underlying principles with the assurance that the mechanics for carrying out these principles can be easily and readily set up and operated.

(a) *The Standard Productive Hour*

In the plan that I am recommending the important basic factor that must be understood is *the standard productive hour*. It might be defined as the standard amount of product that is to be turned out in an hour at every operating or cost center of our whole plant.

With the determination of the standard amount of product that should be produced in a given time we obviously have available the normal volume of production possible within our plant. Thus the standard productive hour forms the basis upon which budget allowances for all overheads should be based. When the number of standard productive hours falls a definite budget allowance for all expenses is automatically set up for the curtailed production. Conversely, when the production is speeded up beyond the normal, a specific budget is available for that attractive situation.

The standard productive hour must be determined for each operation. The production manager will describe to you later the character of the engineering studies which are now in progress to accomplish this phase of the work. He will explain how operating speeds and feeds are being determined for machine tools, how standard instructions are being prepared governing the maintenance, repairs, routine lubrication and inspection, of all machinery and equipment, and in general how all operating elements are being brought to a high level of effectiveness. Time and methods studies are the media through which much of this work is being accomplished. You will hear more of this in detail later, also how these studies are being used as a basis for a scientific wage system.

(b) *The Meaning of Normal Capacity*

Normal capacity for Naca is based upon the number of standard production hours needed to turn out the average sales expectancy taken over a long sweep of time—eight or ten years. It must be kept in mind that the excess capacity of buildings and equipment at Naca is sufficient to take care of our expected growth at least for ten years to come.

(c) *The Standard Labor Rate*

The standard labor rate comes next. The weighted average wage rate of each cost or operating center is called the standard labor rate. By taking the standard time for doing an operation and multiplying it by the standard labor rate we have the standard labor cost for carrying on that operation.

(d) *The Standard Overhead Expense Rate*

The standard overhead expense rate is obtained by taking the

direct expense of a cost center and adding to it the cost center's share of the general overhead expense (both at normal capacity). If we divide the monthly total of these two expenses by the standard productive hours of normal capacity we have the standard expense rate per hour.

(e) *The Standard Operating Cost Rate*

The standard operating cost rate for any cost or operating center is obtained by combining the standard direct labor rate with the standard overhead expense rate. The detailed procedure in arriving at this rate is so necessary for an understanding of standard costs that I wish to build up for you a concrete example taken from one of the plants who helped me in my survey of Naca.

A certain cost center in this plant cuts pipe. It has a measured performance of 3,500 standard productive hours for a month. Therefore, this 3,500 hours represents a definite amount of pipe cutting measured to a fixed standard of performance. Next, consider the amount of direct expense of this same cost center for the month. A budget is set up for these expenses at normal capacity of 3,500 direct labor hours. This budget is $4,200 made up as follows:

TABLE NO. 1—MONTHLY BUDGET OF DIRECT EXPENSES AT STANDARD VOLUME FOR COST CENTER NO. 1 (CUTTING PIPE)

| | |
|---|---|
| Foreman | $300 |
| Assistant Foreman | 175 |
| Miscellaneous Wages | 250 |
| Inspectors | 200 |
| Clerks | 300 |
| Helpers | 550 |
| Repairs | 620 |
| Defective Work | 250 |
| Material Handling | 900 |
| Supplies | 305 |
| Overtime Bonus | 350 |
| Total | $4,200 |
| 3500 Standard Hours | |
| Standard Hourly Rate | $1.20 |

In addition to this budget of $4,200 for direct overhead expenses, this cost center is likewise budgeted for its share of the prorated expenses. This prorated budget is $2,600, and represents the cost center's share of the total prorated expense of the entire plant at standard capacity. By adding the direct expenses of $4,200 and the prorated expenses of $2,600, this cost center has a total of overhead expenses of $6,800. This budget of overhead being the normal capacity of 3,500 standard hours, we divide the $6,800 by the 3,500 standard productive hours and the result is $1.90 as *the standard hourly costing rate for the overhead expenses of cost center number one.* This rate, and this rate only, is used for costing overhead for every hour or fraction of an hour for all production taking place in this cost center.

To the standard cost rate of $1.90 to cover overhead expenses there is added sixty-five cents per hour for every hour of direct labor. This direct labor rate is the weighted average wage rate and is used as the standard for the cost center. These two figures give $2.55 as the standard cost rate for the operation known as "cutting". Given the standard time any job is scheduled in cost center number one, and multiplying that time by $2.55, the result is the standard cost of the cutting operation on that job. All other cost centers have their standard cost rates established in exactly the same manner.

(f) *Standard Costs and the Route Sheet*

The next step is to gain the meaning of the *route sheet.* By the use of a route sheet there are shown all the cost centers that a given order passes through and also the amount of standard time the order is scheduled for each cost center. By means of simple addition we then find the total of standard costs of that order, which represents the standard cost for all manufacturing operations. If to this standard cost of manufacturing operations we add the standard cost of material, there is obtained the standard manufacturing cost of the order.

(g) *Material Standards*

Standards for material used in our productions come under two distinct categories.

First—Price standards for our purchases.

Second—Yield standards for the control of consumption on plant operations.

(1) *Price Standards.*

The purchasing agent, in cooperation with the controller, will establish standard prices for our raw material. Prices for both iron and steel stock can be forecasted with comparative ease. Through the use of standard material prices we will erase from our cost calculation the widely fluctuating conditions that short time price changes have produced. Forced as we often are to buy warehouse stock has made such pronounced changes in our actual cost calculations as to be grossly misleading to both our president and our sales manager.

(2) *Yield Standards.*

By use of yield standards Naca can readily acquire a definite control over its defective work. Not only will the defective costs be accurately measured, but definite foreman responsibility will be established. To illustrate, foreman Steck of the puncher should be given data showing what the standard yields are for the product for which he is responsible. Weekly variance reports also should be given him of how close his men are meeting the yield requirements that have been established as standards.

(3) *New Standards and Inventory Pricing.*

The problem of evaluating our inventories at the close of the year looms important where changes in our standard costs are made. I suggest the following procedure:

That all inventories at the close of the year be evaluated at the standards set for the new year. Should they show a greater value than those of the closing year, the difference should be credited out to a reserve account which we might term "inventory adjustment reserve". If the new standard costs are less than the old then this reserve account should be charged accordingly. If no reserve balance exists the loss account for the closing year should carry the burden.

(h) *Variances*

The difference between standards set and the actual results accomplished forms the basis of interpretation and control of plant activities under standard costs. Variances are thus out-of-line conditions calling for careful analysis, study and action.

A clear-cut distinction must be made between those variances from standard costs which are due to the different volumes at

which the plant operates and those variances that are due to the high or low efficiency under which the plant is operating regardless of the volume. The first of these we will term volume variance and the second the controllable or efficiency variance.

(i) *The meaning of Volume Variance*

Overhead expense tends to vary with the volume of production. Not, however, in the same ratio. Certain overhead expenses continue at the same amounts regardless of production. Such items as depreciation, insurance, general superintendent's salary, taxes, and the like are "fixed", and therefore do not vary in amount, regardless of whether production is at forty per cent of capacity, or 120%. By using the same standard cost rate for work performed, regardless of the volume produced, much of this fixed overhead expense fails to get charged into production when volume is slack. Conversely, more overhead expense is costed into production than is necessary when production runs above normal.

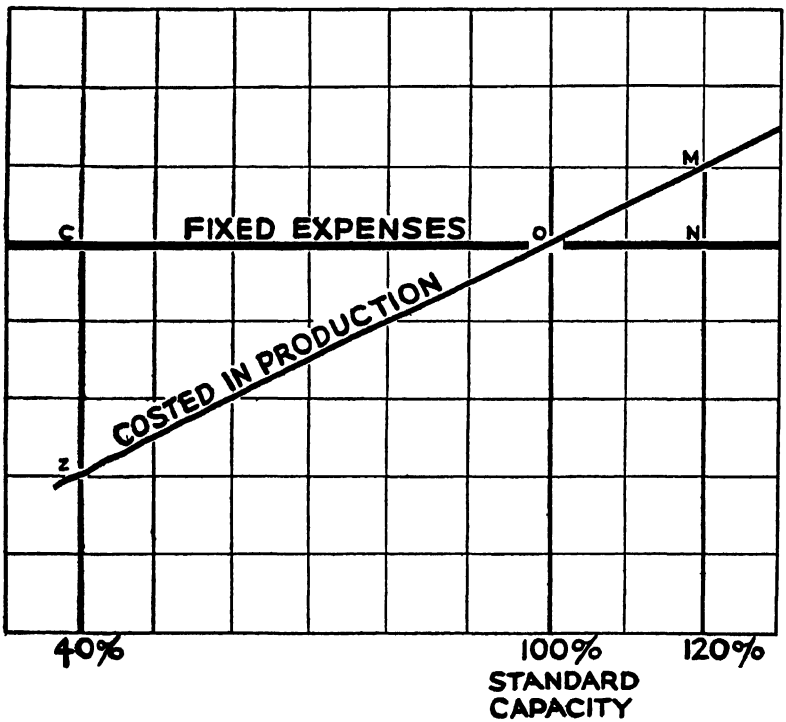



FIGURE 2

If production were at forty per cent of normal capacity, then the standard cost rate (always the same) would fail to absorb all the fixed expenses. It would fail to do so because not enough production had passed through the plant. C-Z (figure two) thus represents the portion unabsorbed and would be an unfavorable variance due to insufficient volume.

Had production gone beyond normal capacity—say to 120%—then the variance would be favorable as we have costed the amount at point M and our budgeted fixed expenses are at N. Thus M-N is the favorable volume variance when producing at 120% of normal capacity.

Certain other overhead expenses, however, change in amount with the volume of production. These we termed the variables. Such items are "operating supplies" and "compensation insurance expense". Again, there are others that vary somewhat with production, but not to the same extent—such as "power," "defective work," "oilers," and "production clerks." These overheads that tend to change with production constitute the variable overhead expenses as contrasted with the fixed items.

If we combine all the overheads, both fixed and variable, therefore, we find that the composite represents a budget curve that bends with production but not in the same ratio.

(j) *Calculating the Volume Variance*

By the use of actual figures let us see how volume variance is calculated. By studying the volume variance sheet, figure three, we find that, for the week of March 3-8, the pipe cutting cost center produced an amount of work of 4,248 standard hours of performance. This production is 121.37% of the normal volume of capacity of the section, namely, 3,500 hours. At this production capacity of 121.37% of normal there is already set a standard budget for the overhead expenses. By referring to figure four the budget at 120% capacity is found to be $4,800. To this is added $40 to meet the estimated needs of the additional 1.37%. The budget then for a capacity of 121.37% of normal production is $4,840. The specific items making up this total are seen in column three, of figure three.

Taking the actual standard hours worked during the week, namely 4,248, and multiplying it by the standard cost rate for the direct overhead expense of this center, $1.20, there is costed into

## VOLUME VARIANCE SHEET

Date..Week Mar. 3-8, 1930 — Cost Center--Name "Pipe Cutters" Cost Center No. C1

Standard Capacity Hours - 3500 = 100% — Actual Performance of Standard Hours - 4248 = 121.37% Capacity

| EXPENSE ITEM ACCOUNT | CODE | ① BUDGET AT STANDARD VOLUME | ② COSTED INTO PRODUCTION | ③ BUDGET AT ACTUAL VOLUME (121.37%) | ④ VOLUME VARIANCE |
|---|---|---|---|---|---|
| Foremen | 21 | | | 300 | |
| Assistant Foremen | 22 | | | 175 | |
| Miscellaneous Wages | 23 | | | 250 | |
| Inspectors | 24 | | | 250 | |
| Clerks | 25 | | | 300 | |
| Helpers | 26 | | | 595 | |
| Repairs | 27 | | | 665 | |
| Defective Work | 28 | | | 410 | |
| Material Handling | 29 | | | 1090 | |
| Supplies | 30 | | | 380 | |
| Overtime Bonus | 31 | | | 425 | |
| | | | | | |
| TOTAL | | $4,200 | $5,098 | $4,840 | + $258 |

production $5,098. But the budget needs for this volume of production are set at $4,840. The difference of $258 is due directly to the excess volume above normal which the week's production has accomplished. This $258, therefore, is a favorable item and is known as "volume variance."

(k) *The Controllable Variances*

Controllable variance may well be defined as the difference between the budgeted expenses set up for a specific volume of

# BUDGETS OF DIRECT EXPENSES FOR VARIOUS VOLUMES OF PRODUCTION

Cost Center-Name-Pipe Cutting
Cost Center No. C-1

| EXPENSE ITEM | | % OF CAPACITY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACCOUNT | CODE | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 110% | 120% | 130% | 140% |
| Foremen | 21 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| Ass't Foremen | 22 | – | – | 90 | 90 | 175 | 175 | 175 | 175 | 175 | 225 | 225 |
| Misc. Wage | 23 | 200 | 200 | 200 | 200 | 250 | 250 | 250 | 250 | 250 | 300 | 300 |
| Inspectors | 24 | 100 | 100 | 150 | 150 | 200 | 200 | 200 | 200 | 250 | 250 | 275 |
| Clerks | 25 | 150 | 225 | 225 | 225 | 300 | 300 | 300 | 300 | 300 | 350 | 350 |
| Helpers | 26 | 300 | 340 | 390 | 450 | 500 | 525 | 550 | 570 | 590 | 610 | 625 |
| Repairs | 27 | 300 | 370 | 440 | 560 | 580 | 600 | 620 | 650 | 660 | 670 | 680 |
| Defective Work | 28 | 30 | 50 | 100 | 125 | 150 | 200 | 250 | 325 | 400 | 475 | 550 |
| Material Handling | 29 | 530 | 590 | 650 | 720 | 795 | 845 | 900 | 980 | 1080 | 1190 | 1130 |
| Supplies | 30 | 135 | 160 | 135 | 225 | 255 | 280 | 305 | 335 | 375 | 415 | 450 |
| Overtime Bonus | 31 | 140 | 175 | 210 | 245 | 280 | 315 | 350 | 385 | 420 | 455 | 490 |
| TOTAL | | 2185 | 2510 | 2890 | 3290 | 3785 | 3990 | 4200 | 4470 | 4800 | 5240 | 5375 |

FIGURE 4

production and the actual expenses that are incurred in producing that volume.

Mention was made of the necessity of having different budgets made out for the different volumes of production at which the plant or cost center may operate. Further, it was shown that a comparison of the amount of overhead expense costed into production at the standard rate contrasted with the overhead expense budgeted for that production showed the volume variance. If, then, the actual overhead expenses at any capacity are set against the budget of overhead expenses for that capacity, there are obtained variances that measure the performance of the plant managers in meeting their budgets. As direct overhead expense is definitely budgeted for cost centers and prorated expenses for the general manager and superintendent, this means that the supervisory head of the cost center and the managers of the plant are held responsible for all the expenses that are incurred.

Thus we come to the very heart of standard costs in controlling expenses. *The ability to place before each plant manager of the plant, from foreman of each cost center to general manager, a group of overhead expenses for which each is made responsible and for which each is budgeted gives a definite control of overhead expenses that the science of cost accounting has heretofore never accomplished.* Make no mistake about it! No more are overhead expenses allowed to dangle around in thin air. Rather, they are now budgeted i.e., standards set, for those specifically responsible for making savings. Not one solitary item of overhead expenses can remain unbudgeted. And, further, no budgeted overhead expense item can remain outside the definitely named manager or foreman who is responsible for its control. In brief, every overhead expense item is budgeted and placed under a definite personal control. Such procedure places overhead expense control under the same rigid measurement that standard timed labor rates have established for direct labor.

(1) *The Determination of Budget Items for the Supervisory Force*

The following one hard and fast principle must be followed in determining what items go into a budget for a specific supervisor. Only those overhead expenses that are wholly within the division of the plant budgeted (direct expenses) and that portion of the

prorated overheads which are allocated to the division on a scientific and unquestionably fair basis can be placed under the responsibility of the supervisor of any division. No arbitrarily prorated items can go into any budget. Such items are left in the budget of a higher supervisor where no prorating is necessary. If, for instance, a rate setter covers five cost centers, his salary is not prorated to the five cost centers. Instead, his salary comes under the superintendent's budget where no prorating becomes

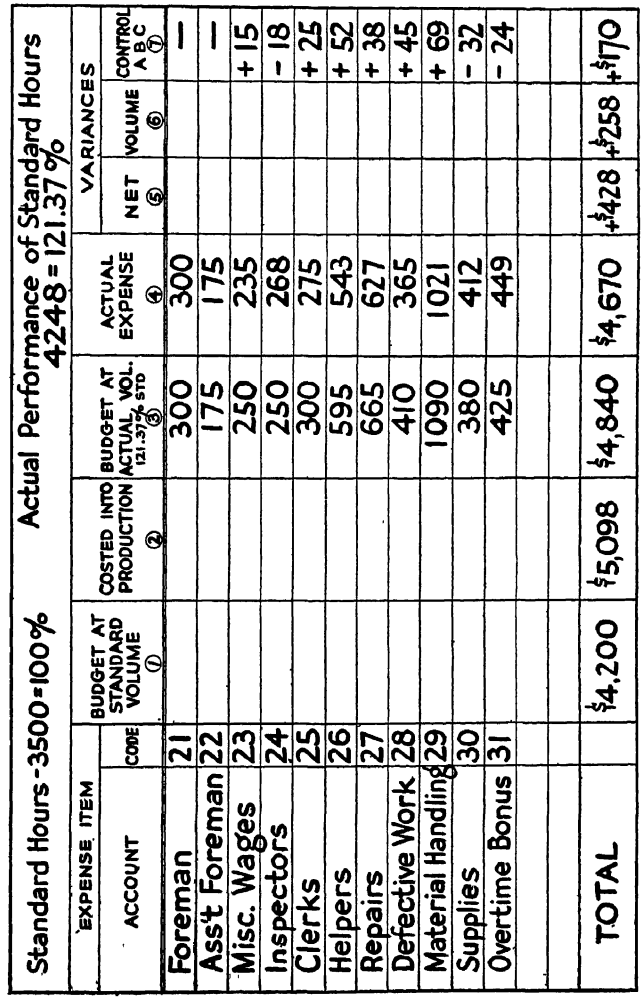



FIGURE 5

necessary. Likewise, certain portions of other overhead expenses, such as first aid, shop accounting, police expense, and the like can not be broken down except by arbitrary rulings. Very well—do not break them down, but put them into the general manager's or superintendent's budget. By following this principle never is the Accounting Department embarrassed by having to try to justify the splitting of expenses and budgets among several cost centers.

Again at the expense of repetition, the conclusion must not be drawn that certain expenses must not be prorated for costing purposes. All prorated items must be broken down to cost centers in order to get the standard cost rate for the cost center.

(m) *Calculating the Controllable Variance*

Let us now repeat the figures in figure three here, but we will place the actual overhead expenses for the week of March 2-8 against the budget. This is shown in figure five. These actual expenses are collected according to each item of the budget. The detailed showing of the controllable variances is thereby made possible. To illustrate, take the item "miscellaneous wages—code 23". The budget for this item was $250, the actual expense paid $235, or a favorable controllable variance of $15. This definitely gives the foreman of this cost center the performance of his miscellaneous wages. The same holds true of inspectors, clerks, and the remainder of the expense items.

The total controllable variance experience of this cost center for the week shows $170, found by comparing the weekly expense budget of $4,840 with the total actual expenses of $4,670. It is this $170 that represents definite savings in this cost center and it is the amount upon which key man bonuses are calculated. The savings of $170 are identified with cost center number one, cutting pipe, and the foreman and assistant foreman of this section are rewarded specifically for the savings they have made.

(n) *The Follow-up Sheet—Unfavorable Variances*

To show the amounts of controllable variance as presented in figure five is not sufficient information for plant managers. These figures show the amount of the variance and the item in which the variance occurred. What to do about it, needs a follow-up. Figure six is a form arranged for the purpose of following up all

# THE FOLLOW-UP SHEET
## UNFAVORABLE VARIANCES

Cost Center C-1 ... Foreman Clarke

| FALL-DOWN ACCOUNTS | | | NAME OF RESPONSIBLE PERSON | CAUSE OF OVER BUDGET | WHAT TO DO | REPORT OF PROGRESS | | |
|---|---|---|---|---|---|---|---|---|
| NAME | CODE | AMT. | | | | MAR. 12 | MAR. 14 | ETC. |
| Inspectors | 24 | $18. | Fred Stone | Slow Checking | More efficient scheduling to prevent delays | New Schedule drawn up | New Schedule Working | O.K. |
| Supplies | 30 | $32. | Pete Wells | Over pull of paint from storeroom | Cannot be prevented | | | |
| Overtime Bonus | 31 | $24. | Tom Fry | Necessary to complete specific job | Better scheduling of rush orders | Check all rush order work | O.K. | O.K. |
| | | | | | | | | |

FIGURE 6

the unfavorable variances. Definite causes are listed and a report of progress indicated.

The listing of the responsible person is attractive. It gives a personal responsibility for malconditions and portrays the endeavor to make amends.

The importance of this plan of determining controllable variance must be driven home hard. The identification of controllable variances in the plant with supervisory responsibility constitutes a tremendous stride forward in redeeming overhead expenses from the class of illusive uncertainties to placing them under a rigid and definite control.

(o) *Labor Variance*

Labor variances from standard are of three kinds: first, where the worker produced faster or slower than standard; second, where bad material, defective machinery, etc. made necessary a granting of additional time over standard to do the work—this variance might be termed "extra allowance". Then there is a third variance because of rates where the actual rate paid is below or above the standard rate.

*Standard Costs Are Basic to Other Improvements Necessary for Naca's Progress*

I wish it were possible for me to wipe from the records of the National Association of Cost Accountants the word "standard costs" and substitute just "standards". Standard costs, in their practical application, go far beyond the limited moorings that "cost accounting" implies. They not only demand a fine organization of our industrial establishments but set up managerial controls that actual costs can never hope to accomplish. But much more than that! They are the necessary background for production planning and coordinating production with sales. They demand careful study of our manufacturing methods. And they give the tools for successfully combating the gross waste that has a malignant grip on most industries—excessive overheads.

The speakers that follow me, I know, realize the importance of standard costs. In it they see the base upon which their programs must rest. And as they develop their programs for Naca, I urge that you note how all their practical suggestions have sturdy tap roots that go right back to sound and scientific cost accounting—and that means *standard costs.*

MR. JAMES (Naca Manufacturing Company): Now, co-directors, I wonder if you are at all in doubt about the persuasiveness of this young cost accountant of mine. Personally, he has sold me bait, hook and sinker, which leads me to remark that he is quite a fisherman himself and he has taught me to be something of a fisherman. We sometimes go out together and catch some fish, and I want to say that as a fisherman, he is just as good as he is as a cost accountant.

I am happy to have had him give you the same line of talk that he has given me. I believe, not only for the Naca Manufacturing Company, but for industry as a whole, he is blazing the way in which we shall set our house in order for the good day that is certainly coming in American industry.

Now there isn't quite time, before luncheon, I fear, to allow us to go ahead with any of the rest of the detailed program that we have for your consideration. I haven't been satisfied merely to take this young man's advice. I think it is good, but I have checked it up elsewhere. From what I have found out in other lines of successful industry they have taken up these very same methods; of determining the business which is available to each one of them, by scientific market analysis; of establishing definite sales quotas for every salesman in the field and for every customer; of basing production schedules on what the Sales Department can definitely promise in the way of sales; and of basing their whole financial plan on that. Accordingly I have been able to persuade those people who have got to provide the filthy lucre to carry on this organization that we are now on the high road toward setting this organization of ours onto the way of a better future, so that instead of red figures on our profit and loss statement, instead of less than a par value for our capital stock, our balance sheet will yet again show an accumulated surplus.

All of these plans we are going to give you as soon as we can, but it occurs to me that at this particular time it would be most appropriate for any of you who may have any questions to ask, or who may have any experiences of your own to contribute to get up on your feet and tell us precisely what you think will contribute most toward a constructive program for our own future prosperity and for the future of American industry. I want each one of you individuals to feel perfectly free to say what is on

Will someone volunteer to be the first one who will say something on this subject?

A. B. SNYDER (*Supervisor of Plant Accounting, Owens-Illinois Glass Company, Toledo, Ohio*): I would like to know how you control your direct labor in these various departments, on the daily or monthly basis?

MR. REITELL: Each job assigned has the standard time put on it before the worker begins. Daily progress is noted on the time-card by the foreman and when the job is completed, the actual hours are interpreted in terms of standard hours.

At the G. H. Williams Company the runs are so short that a weekly check up of actual and standard hours is possible. Incompleted jobs at the end of the week are simply charged with actual hours and the difference between standard and actual put in the week at which the job is completed. The unit for measuring direct labor is the standard allowed hour which is a definite amount of work to be accomplished in each cost center in a given time. This standard allowed hour is the basis upon which all overhead budgets are compiled. In short, the amount of standard allowed hours produced is the amount of volume put through.

MR. SNYDER: After hearing what Mr. Reitell has just said, I want to bring out a further point. Later on you are going to control on a current basis. Now, is that labor in your direct labor department to be controlled and reported to the local department manager in dollars and cents or by man hours?

MR. REITELL: Direct labor should be controlled and measured by man power, not by dollars and cents. For any cost center, regardless of what rate of pay is paid, the work there is at a standard labor rate which, multiplied by the standard hours, gives the standard labor cost.

MR. SNYDER: In other words, he has to have some daily statement to get the fall-down.

MR. REITELL: Absolutely. I am thinking of one plant in which they make grab buckets. Their reports come out daily as

to what a man is expected to do and what he actually does, but not in terms of dollars and cents.

MR. SNYDER: You have another problem there—indirect labor.

MR. REITELL: We feel that indirect labor is a problem of the foreman. I am only giving you my own personal idea on that. I feel that indirect laborer in a cost center is the foreman's tool to help him out. He is an assistant to the foreman. You can't put a rigid time study to him, but you can put up something just as rigid. Allow so much indirect labor based upon a given amount of standard allowed hours of direct labor.

E. W. KRUEGER, (*Partner, Walton, Joplin, Langer & Company, Chicago, Ill.*): I bought Naca stock at the low. I am wondering in this discussion whether it wouldn't clarify the atmosphere a little if I knew, being a new stockholder, whether our line of industry covers the production of the standard product which we would sell to the various channels, or whether we are making products to customers' specifications. I think that would help in making the point more definite.

MR. REITELL: I think that is very important, and I believe that our sales manager is going to discuss that.

MR. JAMES: Our sales manager is going to cover that point very splendidly for us.

THOMAS J. BURKE, (*Director, Cost Department, American Pulp and Paper Association, New York City*): In some industries, the paper industry for one, very often the machine governs the direct labor to some extent.

MR. REITELL: You mean the paper machine?

MR. BURKE: Yes. I believe that you have had some professional experience in this field with one of the large companies and in setting up the overhead, what did you take as the number of operating hours for paper machines for a year?

MR. REITELL: I don't believe it would be good professional ethics for me to discuss here in this group any one of my clients. I am perfectly certain that this client would be glad to have me do it.

MR. BURKE: I know they would, or I wouldn't have asked the question.

MR. REITELL: But I must refrain from giving the information. I would like to answer your question, but I don't feel that I can.

MR. BURKE: I know what it is. I just wanted to check up on it.

MR. REITELL: Now I'm mighty glad I didn't answer you.

W. M. ROMIG, (*Assistant Production Manager, Hamilton Watch Company, Lancaster, Pa.*): In your analysis of your budget, you delegate various operating standards at forty, sixty, 100 and so forth. In your itemized expense account do you set those up according to percentage ratios for ease in establishing your monetary values?

MR. REITELL: No, we do not! The plan I have been following is to set up the actual figures. There are some other companies, some of which I know about, which have engineering curves established for these expenses, and you go to the point on the curve and find exactly your budget figure. I have been using the tabular form because I find it much easier to present it to the foreman. I imagine there are a lot in the audience who would disagree with that method, but I have used the dollars and cents method, setting it down before them month after month. Never do we work on any percentage basis.

MR. ROMIG: What I refer to is the mechanics of your Accounting Department. For instance, your plant is operating at sixty per cent capacity. After you have arrived at the total amount of money represented in your departmental expense, to get your monetary value for your various lines of expense, for instance in your clerical help in the department, do you use a percentage ratio to your total?

MR. REITELL: No.

MR. JAMES: Let me state the question for the benefit of the audience. The gentleman asks, "How do you set your budget for all the different percentages of activity?" Am I right?

MR. ROMIG: Yes.

MR. JAMES: What is the answer to that?

MR. REITELL: May I have figure four on the screen, please? Now, we call in the foreman first. If I were hired to do the job, I would take the controller-auditor with me and the superintendent and the foreman, and we would sit down and talk, not accounting now, but operations. We would talk controlled expenses and the first thing we would try to work out would be that column, 100 per cent, because that is the figure on which we are going to develop our standard cost rate.

We put down what he thinks it is going to cost. We put down the actual figure, no percentages or ratios, and then we go to lower volumes and say, "Where can you get rid of some of this? Where can you put your assistant foremen on direct labor work and get rid of the learners or young fellows at the bottom? Think it over". He isn't going to be right the first time, but we are getting him to think in a managerial way. I have found that a series of figures is easier for a foreman to grasp and I have used and am using them in several places. Is Mr. Bass in the room? Mr. Bass, won't you tell us how you do it with the curve method?

A. W. BASS, (*Director of Budgets, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.*): I was thinking of the curves as Mr. Reitell was talking this morning, and I think the operation of those curves has brought out one of the rather significant things of this standard cost plan.

We do have curves on expenses like those of foremen, inspectors, and various others where there is an element of fixity. It was thought in the past that there was a great deal of the element of fixity in some of these foremen's expenses, but if you noticed on Mr. Reitell's chart, he showed more or less specific points at which a foreman or an assistant foreman would be taken off.

We found however, that during this depression and with these standards on a curved basis before the foreman, indicating at any point of activity the amount of allowance which appeared in the budget, there has been an interest aroused. I might possibly say that interest has been stimulated by the fact that we had a key man supervisory bonus established on top of these standards, but they have taken an interest any way, with the result that we don't have those sharp points of cleavage between one foreman and two foremen or three foremen.

We are finding on those curves, which we originally established more or less, as Mr. Reitell's figures show, as step curves going up to a certain place and then on over a level of activity and then up again, that they are pretty smooth curves right through, because we have developed new features in management which we were not acquainted with before and which the foremen themselves have come to develop during this time of depression. They find they don't have to wait until we get down to a certain level of activity before an assistant foreman can be taken off. They begin to do that gradually. They furlough an assistant foreman possibly a part of the time. They begin to put him on productive labor for part of the remaining time. They have found various new techniques, with the result that we really have our control on a more or less smooth curve.

MR. JAMES: Mr. Reitell has prepared what is to my mind a most important instrument in the effective administration of this plan of determining the method of preventing and overcoming the variations that are disclosed by the accounting returns. I am going to ask him if he will not put up on the screen again that follow-up sheet (figure six) of his which, to my mind, is one of the best things he has developed for the Naca Manufacturing Company and others. I'd like to have him tell us more about it.

MR. REITELL: In 1925 I was very much impressed by a manager who came to me and said, "I wish we could humanize cost accounts in this plant". After talking to him awhile, I found that this is what he meant; Instead of labeling cost accounts by technical names, shop labor, unloading, and so on, he labeled them, Jim Anderson, Tom Downs, and so on. That was only for shop practice. That idea stuck in my mind as being a thing we ought

to work at a little bit, and here is a follow-up sheet (figure six). I have taken the variance sheet and transferred the fall-downs, and instructions as to what to do. You will notice on the left a simple transcription of our operating code twenty-four, thirty and thirty-one, and the amount of the fall-down.

Then I indicate the name of the person responsible and the cause of the over budget. I do not put it down when he is under the budget. Here is Fred Stone whose cause of over budget was slow scheduling. What is he to do? More efficient scheduling to prevent delays.

Then we have two days' check-up with the foreman and the cost man to see what progress is being reported. The same thing is done with supplies and with overtime bonus. There you have Tom Fry who overspent twenty-four dollars which was necessary to complete a specific job. He asked for better scheduling for rush orders, and that has resulted in a better figure for the total they could do in rush order business.

I am sorry I can't go into the supplies control today. It is amazing the savings that are possible when you make manufacturing supplies chargeable to the foreman. I have never found one foreman in a hundred who thinks of supplies in terms of the use of those supplies. He simply orders the quantity from the storeroom in the standard package conception he has had, a dozen or a box. If he needs seven bolts, do you think for a moment he orders seven? The old way was to order a dozen and what became of the five is a mystery.

Also, when you have a foreman making out his own requisitions and knowing that each week a report is coming back, believe me, it is amazing what savings can be accomplished. They just hadn't thought about savings in that form and shape, but when they have the target to shoot at, it is very fine. I like the follow-up sheet idea because it puts down on paper the name of the responsible person.

MR. JAMES: Now does anybody else want to ask any questions or contribute anything?

J. THOMAS OTTO (*Manager, Business Methods Division, Armco Culvert Manufacturers Association, Middletown, Ohio*): How often do you get these reports out? Are these reports given to the foreman weekly or monthly?

MR. REITELL: I like a weekly report, particularly on supplies. On indirect labor it should be a weekly or even a daily report.

MR. OTTO: Don't you find that the foreman forces you into it even though your practice has been monthly?

MR. REITELL: Absolutely, and I think it is standard practice now, when your foreman starts a man on the job with complete instructions, to have an understanding that if something is wrong it will be reported at once. The important thing is not to let the workmen go along with bad material and bad machines and have to fight for an adjustment. If something is wrong, it ought to be the duty of the foreman to take cognizance of it immediately and get the trouble remedied at the start.

N. J. BOWNE (*Cost Accountant, The De Laval Separator Company, Poughkeepsie, N. Y.*): Are you recommending as standard practice, or are there any objections to, the inclusion of foremen's salaries in the departmental budget, which I understand you claim is made up of items controllable by the foreman?

MR. REITELL: The foreman's salary, which is entirely within the four walls of his operating center, is in that budget, but that doesn't mean that he sets the $300 in that case, as his salary, nor does it mean that he sets up that budget with final authority. That should come before the trained standard cost man.

MR. BOWNE: Is there not another plan which might be equally valuable, that is, including in the expense of the superintendent or the division head the item of the foreman's salary?

MR. REITELL: I am not so certain! I see a little advantage in that, but it does not give your direct cost rate to your product for that operating center. If you pull out the $300 and throw it up to the superintendent, you immediately make a prorated item out of an item which you don't have to prorate and, therefore, while your costs may be more lucid, they are certainly not as scientific or clear cut as if you left it in the cost center where it becomes a part of the direct rate.

MR. BOWNE: Then the budget is not entirely a controllable budget?

MR. REITELL: Absolutely yes!

MR. BOWNE: Are the foremen of the Naca Manufacturing Company going to control their own salaries?

MR. REITELL: I mean budgeting here rather than controlling. The foreman is not going to set his own salary, but he will work out with the superintendent, for instance, at what time he must become "direct labor" and cease being "overhead expense". He has to work out with the superintendent or the cost man when he will lop off some of his salary and put him on "direct labor" for part time.

MR. BOWNE: Then he can reduce it, but of course he can't increase it.

MR. REITELL: I don't like to hear you say that. I didn't get my story over correctly if you say that. The point is, he works cooperatively as far as it is humanly possible to work cooperatively with the cost man and the superintendent in trying to arrive at what is a fair return for his services. You would add this controllable item in the superintendent's items. But I see a grave weakness in that because you pull a big amount of controllable expense out of the cost center.

MR. BOWNE: I see no reason why such an item can't be charged properly instead of prorated on an improper basis.

MR. JAMES: Let's say this: He must justify his own salary.

MR. REITELL: That is probably putting it right.

MR. JAMES: He must justify that amount that is paid to him in salary. He must show that the activities of his department warrant the payment of that much money to him. It is a matter of making a business man, if you please, out of the foreman himself. Now, it is perfectly obvious to him, as it must be to the man-

agement, that if his salary is out of line with the productive activity of his own department, then his salary must be adjusted downward if that disparity is downward. On the other hand, if it is upward, then we lay in his hands the very argument in his favor as to why his salary should be raised, and if I, as president of the company, do not recognize that, then I do not recognize as I should the productivity of that individual.

It is placing his own salvation on exactly the same basis as those things of which he has direct control. Does that answer the question?

MR. BOWNE: Yes. It wasn't so much to get a direct answer that I asked, as to find out whether it was recommended as a standard practice. In the experience I have had, we have been occasioned some little embarrassment when the foreman's rate changed, and sometimes I think it is better to leave it off direct expense.

MR. REITELL: I might as well say there is no standard practice in standard costs. I think we can do a wonderful service here in our organization if one of our national divisions were to set up terminology on standard cost so that we wouldn't get into the condition which exists in actual costs. We are starting something new, we are all learning, and we pretty much control a good deal of the thinking along the lines of standard costs in America today. Why not set up standard codes and standard practices and get together on the thing so that fifty years from now, others who are here when we are under the tombstone won't be yammering about different meanings of terms. We should have our terms standardized. I am heartily in accord with that idea.

C. A. PACKARD, (*General Auditor, Worthington Pump & Machinery Corporation, New York City*): What percentage of operating capacity has been used in determining the normal burden to be included in the Naca standard cost?

MR. REITELL: I was hoping that question wouldn't be asked. Shall I read my stock answer to that?

The question, as I understand it, is, "shall the volume of operation be determined by the plant capacity at Naca as representing normal capacity, or shall it represent a careful study of our

sales program as it has been worked out over past years and the normal or what we can expect, let us say, over a long range of ten or twelve years?"

The Naca plant may be overbuilt to take care of expansion five, fifteen, twenty-five, or thirty years hence. To set that as normal capacity is just no good. In other words, our expected normal capacity should be an interpretation of our sales over quite a long-time trend, and if our sales expectancy represents 80 per cent or 75 per cent of our plant capacity, I vote for that rather than the maximum plant capacity as set up by our equipment and our buildings.

HENRY W. MAYNARD, (*Manager, Industrial Department, Herbert F. French Company, Boston, Mass.*): In the first place, I want to echo with enthusiasm your comment on the desirability of getting together as cost accountants and unifying terminology and general procedure.

As you transform your standard budget into an actual budget for a given period, do you go to the point of refinement of making allowance for the length of the working month? Some charges are by the month and some are by the week. Others vary according to the length of the working period. Do you make that allowance, and if so, may I ask how?

MR. REITELL: I don't, but I will tell you where it is worked out. The calendar variance is nicely worked out by G. Charter Harrison in his book, "Standard Cost", published by the Ronald Press Company, New York City. At several plants where they work it out, the budgets are established on the number of working days and to that extent the budgets are adjusted to the calender month's differences.

W. H. STEFFLER (*Cost Accountant, H. K. Porter Company, Pittsburgh, Pa.*): Do you assume that in this plan you are going to be able to build the plant up to some capacity in its own kind of work and then go out in the market and get a different kind of work to help out until business improves? I know a number of plants that are doing that right now.

MR. REITELL: The careful analysis of volume variance is

not only broken down for our plant departments, but it can also be broken down for the small operating centers as we please to set up budgets. In doing that, we have very good information for our sales and marketing divisions as to the down portions of our plant and the degree of "downess", if I might use that word. Therefore, from that situation certainly would grow suggestions as to the development either of the new lines to absorb the bad heavy volume variances, or to stimulate already established lines to absorb volume variance.

In other words, I think one of the fine things in analyzing volume variance in such detail is that it just brings out the suggestion which Mr. Steffler has questioned; namely, that detailed volume variance by different sections of our plant shows us where we have got to place new loads. It may be in new lines; it may be in the further development of old lines. Does that answer your question?

MR. STEFFLER: Not exactly. Perhaps I can make it clearer in this way:—

In setting standard rates for burden absorption it was found necessary in our plant to give consideration to the fact that some units would work less time than others and to adjust the standard rates so that these units would absorb their burden on a lesser number of hours, resulting, of course, in a higher rate.

We listed, under this arrangement, several hundred machines at rates determined to be standard for our production based on our probable output under normal conditions using a five-year cycle.

We then established several so-called production centers to include machines falling within certain rate limits, resulting in having different kinds of machines in the same production center or group. It is necessary for us to go into the market for business foreign to our production but suitable to our machines, and in doing so, we must compete with companies doing a straight jobbing business with machines similar to ours. Obviously our costs established for our standard product cannot be used as a basis for estimating on this kind of work. How can we set up figures which will give us a basis for knowing where to accept or refuse these orders?

In other words, we will put this work in our accounts at our standard rates but we want to know how we will determine the point where our loss will be less than it would be if the machines

were idle. It should be understood that we are doing this as a temporary expedient and for various reasons cannot make a survey to determine possible sales of this kind. We feel it is necessary to establish supplementary informative rates based on total tool capacity to be used for estimating on this kind of work, and that anything earned over these rates would absorb part of the fixed burden even though showing a reduction of gross profit or possibly, a loss.

MR. REITELL: Your question is clear. I would establish the number of standard hours for the special units that would bring your costs in line with competitors. The unabsorbed burden in these special units thus measures your volume variance as unfavorable. Once you have the amount of this volume variance over many months, you have sufficient information to know what you are doing when you quote prices. The unabsorbed overhead of these special units should be charged against profit and loss and not against manufacturing costs.

MR. JAMES: Gentlemen, I am very, very sorry, for I am all pepped up on this idea of the interest that is being taken in this thing, but we must eat. We will continue our meeting after luncheon.

ADJOURNMENT

# SESSION II

# STANDARD COSTS IN THE MACHINE TOOL AND STEEL INDUSTRIES

TUESDAY AFTERNOON, JUNE 16, 1931

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THOMAS B. FRANK, *Treasurer,*
Cincinnati Planer Company, Cincinnati, Ohio.
*Chairman*

ALBERT E. GROVER is a native of the "Buckeye" State. After leaving Mount Union College, he went with the Geneva Metal Wheel Company, Geneva, Ohio, as cost accountant, a position which he held for six years. In 1912 to 1919, he was a senior cost systematizer of Nau, Rusk & Swearingen of Cleveland. He re-entered the industrial field in 1920 as Comptroller of the Dunham Company at Berea, Ohio, but in 1922 re-entered the professional field as manager of cost installations of Kohr, Brubaker & Fisher, of Cleveland. In 1923 to 1928, he was in public practice as a cost consultant on his own account, and in 1928 he began his affiliation as cost consultant with the National Machine Tool Builders' Association, in which capacity he has developed and supervised the installation of the standard cost system for the industry in a large number of plants. He has contributed articles to several magazines and bulletins of the N.A.C.A. and has addressed a large number of our chapters. He is a past president of the Cleveland Chapter and has been a national director of the Association since 1930.

E. R. SMITH is a native of Massachusetts, and after finishing school started work with the Fitchburg Machine Works, of which he was the assistant chief engineer when he left in 1911. Until 1915 he was with the Sauer Motor Company of Plainfield, New Jersey in charge of production control and inventory, and since 1917 has been with his present company, the Seneca Falls Machine Company, almost continuously and is now the vice president, general manager, and a director.

A. W. BASS has been closely affiliated with our Association for a number of years and has been a member of the national board of directors for several years past. In 1905 to 1912 he was secretary and auditor of the Webster Manufacturing Company, Tiffin, Ohio. Since 1912, he has been with the Westinghouse Electrical & Manufacturing Company, which organization he now serves as director of budgets. Mr. Bass has delivered papers before several of our chapters, some of which have appeared in the Bulletins of the Association.

THOMAS B. FRANK followed his high school days at South Bend, Indiana, with accounting work at the La Salle Extension University. Following two years of public practice from 1920 to 1922, he became affiliated with the Cincinnati Planer Company and is now Treasurer of that organization. He has served the N.A.C.A. as a national director for several years and is a past president of the Cincinnati Chapter. He has written articles for a number of business publications and has delivered papers before several of our chapters.

E. J. GOLDSCHMIDT has been with the American Rolling Mill organization since 1917. He was first a cost clerk in the sheet mill and later was transferred to the general cost department. In 1927 he was made statistician of the company and did some special system work when his company took over the operations of the specialty steel division of the John Summers and Sons Company, Ltd., of England. On January 31, 1931, he was made Comptroller of the Armco International Corporation, which is the export subsidiary of the American Rolling Mill Company.

# STANDARD COST APPLICATIONS

## MACHINE TOOL AND STEEL INDUSTRIES

PRESIDENT COLLINS: We are now ready to open our second technical session, and I am sure from the wonderful response that we received this morning it is unnecessary for me to tell you that you have a treat in store for you for this afternoon.

I will now turn the session over to Mr. James.

MR. JAMES: As I told you this morning, I wasn't altogether satisfied that this young fellow, Reitell, knew all there was to know on this subject. I had some pretty good friends in the industrial world, and I ran around here, there, and elsewhere, as you in your wisdom suggested it would be a good thing for me to do, and I asked some of these other folks in whom I had implicit confidence whether or not what Reitell had to say on the subject was just a brain storm, or whether it was founded on the experience of men who had made a success of their businesses by adopting the very principles this young cost accountant was advocating.

Among all the various individuals whom I consulted on the subject, there was one man out in Cincinnati, a very dear friend of mine, a national director of the National Association of Cost Accountants, a member of the Machinery Builders' Society, a member of the National Machine Tool Builders' Association, a member of this, that and the other thing, a man who had written several articles, a man who used to be a public accountant, a man who is treasurer and various other things of various other enterprises out there in Cincinnati and he confirmed the wisdom of accepting young Reitell's advice.

And so this afternoon I am going to introduce him to you. He has consented, as a member of the board of directors of the Naca Manufacturing Company, to come here and tell us what experiences

he has had. He has gone a little further than that. He has brought here with him some of his business associates from Cincinnati and elsewhere in that nearby state of Ohio, where there are some very good manufacturers and where they have made a success of many things along these self-same lines.

Therefore, I am going to turn this afternoon's session over to my very good friend, Mr. Thomas B. Frank, the treasurer of the Cincinnati Planer Company.

T. B. FRANK: Mr. President, fellow directors of the Naca Manufacturing Company: As Mr. James said, out there in Cincinnati we have a number of industries of which we think very highly. In this one particular industry, represented by the National Machine Tool Builders' Association, they have developed a system of standard cost accounting for not one or two manufacturers, but the entire association of some 150 member companies.

This has been quite a task, as you can readily understand, not only in the development of the system itself, but in the selling of this system to the member companies of the association. One of the primary steps in setting up a system of any kind, particularly for an association, is to get out and start an educational campaign among the members of the organization. After all, it is the executives of the companies belonging to the association that pass upon the various system recommendations that their accountants make.

Consequently, one of the first steps they had to take was to go out and sell this system to the members of the association. That was a pretty hard job. They had to start in with what you would call an educational campaign. In doing that, the cost consultant for this association devised a series of pertinent statements concerning the fundamentals of standard cost accounting, which, as I see it, would hit the executives right between the eyes. It would bring out the salient facts for them in a very few words so they could see exactly what the association was trying to do, what the accomplishment of the system would be, and what it could give them as individual companies. There could be no question in their minds then as to whether or not it would be advisable for them to adopt the system.

This may possibly seem more or less elemental to some of the cost accountants in this group but I wish you would forget for a moment that you are cost accountants. Imagine that you are

directors of Naca Manufacturing Company and know nothing about accounting.

We have with us today Mr. A. E. Grover, who, by means of a lantern slide presentation, will show you exactly how he put this system over to the executives of the National Machine Tool Builders' Association.

It gives me great pleasure to introduce to you Mr. Grover.

## SELLING THE STANDARD COST IDEA

ALBERT E. GROVER

Cost Consultant

National Machine Tool Builders' Association, Cincinnati, Ohio

MR. Chairman, president of the Naca Manufacturing Company, and members of the board of directors: I will try to sell every one of you standard costs as we try to sell it to the machine tool builders. We have found a lantern slide presentation very well adapted to that purpose. I will be very glad if I go too fast, to have any one in the audience stop me, then we can leave the slide a moment longer so you can get the point.

But, before I start with the slides, let me say this: I wish that I could have the cost man of the Naca Manufacturing Company with me on some of my travels among machine tool builders to sell standard costs. I thought I was pretty good at selling standard costs, but I find I am a novice.

The first consideration of every machine tool builder—and I think that would apply, Mr. President, to your company as well—is profit. We heard much about profit this morning. We believe that profit should be divided into three distinct classes, standard profit, operating profit, and non-operating profit. Standard profit is the difference between the manufacturing and marketing costs at standard, and the net sales of the company.

Having established a standard cost we may measure standard profit by the elements that make it up. At the same time we have established a standard whereby we may measure actual variances day by day, week by week, or month by month as the occasion may warrant, which we call operating profit.

Of course, the standard profit is shown on the books at the time

we make the shipment. Operating profits are shown in the month in which they actually occur.

If the accountant does not make this segregation and measure it in the period in which these variances occur—well, I just wouldn't want a cost man of that kind in my plant. I would consider that the desk room he occupied could be put to some better purpose.

So I want you to keep in mind, during the lantern slide presentation, the three divisions of profit. We all understand non-operating profit, the profit from elements that have nothing to do with the operation of the plant. Every company has them to a certain extent.

*Editor's Note*

Mr. Grover's material was almost wholly a lantern slide presentation. No attempt is made here to reproduce the form in which the slides presented the material. The wording of each slide is shown in quotation works. The author's interpolations are not so shown.

. . . Presentation of lantern slides as follows:

"Mr. President, you rang the sales bell, but with your figures of actual cost you did not ring the profit bell."

"You need a cost system to tell you:

Where you make or lose money.

When you make or lose money.

How much you make and/or lose."

"How much you should make in every production center, for each product produced, in each territory by each salesman."

"You must detect the leaks that reduce profit. Stop them—before it is too late."

You don't have any chance to stop them unless you stop them at the time in a good many cases.

"But, an ordinary cost system will not tell you all these things as fast as you need to know them because:"

"An ordinary cost system sets no standards against which to measure your effort and performance to tell where, when, and how much."

"Your costs are out of line!"

"Only standard costs produce this vital information."

"You should set up standards against which to measure manufacturing and marketing performance."

"You should forecast your profits and check them up, not merely record costs long after they occur."

That is what we have been doing for the past twenty years, recording them long after they occur. That doesn't mean anything. If we are going to make any money for the company, let's know where these things are occurring and put in corrective measures at the time.

"Standard costs will give you all the information you can profitably use, at the least cost of costing effort and as promptly as you need it."

"Standard costs will help you to establish profitable policies in selling, pricing, financing, manufacturing and development."

"You should know how much your actual profits deviate from the standard which you have determined you should get."

"Standard costs classify profits as standard profits, operating profits, and non-operating profits."

"The profit and loss statement shows that standard profit equals net sales minus standard costs. Operating profit equals standard costs minus actual costs."

Mr. Director of the Naca Manufacturing Company, is that very difficult to understand? It is a pretty simple equation.

"Sales and costs and profits are all classified by products because some sales may cause losses."

Let's look at these profit bags shown in figure one. One of them doesn't look so good. Machines are showing a nice string of gold dollars dropping into the standard profit bucket. Repairs are contributing their share toward this standard profit, but owing to the fact that we don't keep as good records in our plants on accessories the losses that are falling into this loss bucket here are not measured. These losses in many cases are pouring in through here (indicating profit line) retarding the flow of those gold dollars, and because we don't have the measure of standard costs, we will measure these two elements simply as profit and loss.

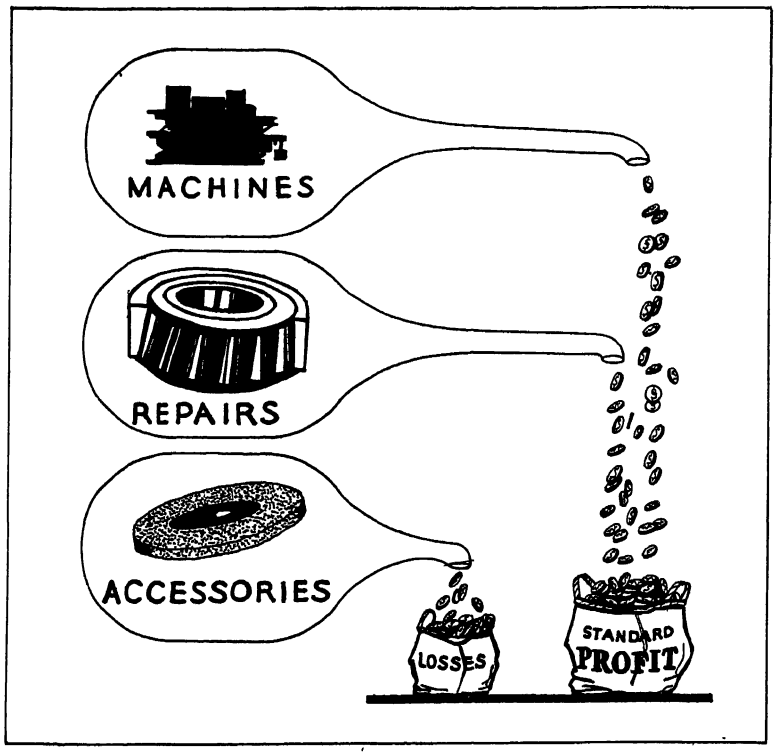


FIGURE 1

QUESTION: What do you mean by accessories?

MR. GROVER: In the machine tool industry accessories are any parts that might go along with the product but are not particularly a part of the machine.

"Set standard selling costs for your different territories based on research as to potentials."

"Then compare actual territorial costs with standard costs of selling."

Every industry, as well as machine tool builders, has this territorial element to analyze. Unfortunately, there are a few machine tool builders today who insist on selling machines over in here, (see figure two) or trying to (pointing to western area of the

United States), so we have determined that we must make a pretty thorough analysis, or do some research work to find the place that our sales effort will produce the most profitable results.

So we say that territorial research work will give us our potential sales upon which we may establish a standard cost and having established that standard cost, we are in a position to measure our standard profit. The accounting procedure gives us the actual cost of selling the products in these various territories. The variance, therefore, between standard cost and actual cost is operating profit, or operating loss, as the case might be.

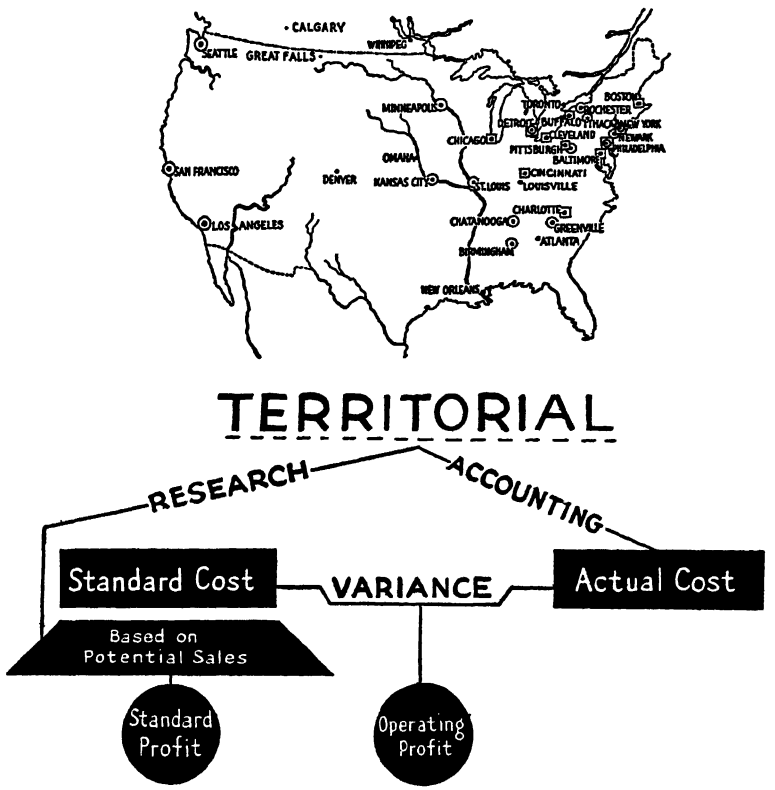


FIGURE 2

"Operating profit comes from improvement in design, more efficiency in manufacturing, better control of marketing."

You will notice from this chart, figure three, that the improvement in designing contributes its share toward the operating profit. In other words, if the design is right, it will sell readily. If it is something the trade needs and can use effectively, then the design of the machine has as much to do with the producing of profit as the actual performance in the factory and in the selling organizations.

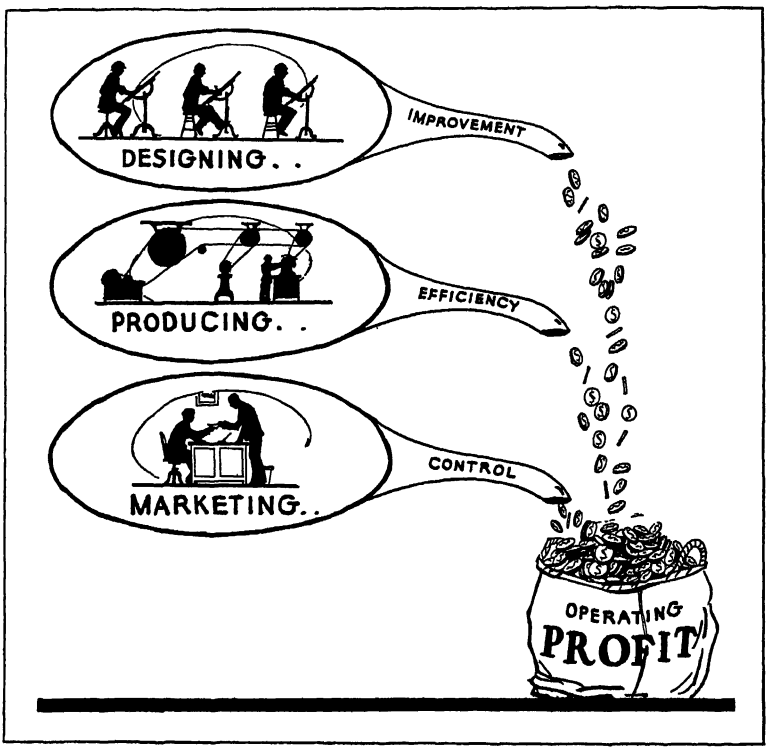


FIGURE 3

Efficiency in production contributes its share. Control of markets contributes its share to the operating profit. Oftentimes market control will contribute more than the others do. It doesn't mean, because we have set them up in this form, that market control has less effect than the others. We merely set this up in this form to show that they are all contributing to the operating profit.

"Profit and costs of manufacturing and selling can reasonably

differ in amount and rate on different products sold at different places to different customers."

"You might want to sell some high cost product at a low price to a difficult customer at a distant place, so"

"Your cost statements should measure each of these additional costs so that they will tell you when to refuse an order and why."

And let me take just a moment to explain why we say this, "When to refuse an order and why". The question in industry today isn't when to take an order and why. It takes backbone to say when to refuse an order, and why, in times like this.

"You should get daily reports on"

"Orders booked, with standard costs and profits by classes."

I am wondering how many companies there are in this good old United States that know how much standard profit they are going to make as their orders come over the order desk.

"Shipments made with standard costs and profits by classes . . ."

Of course we get this pretty commonly with the costs, such as they are.

"Actual performance of men and departments measured against standards of hours and money."

Again let me say, in connection with this statement concerning hours and money, I am heartily in sympathy, Mr. President, with your cost man when he says the entire foundation of standard costs rests upon the productive hour. We in the machine tool building industry believe that is absolutely true, and we believe it should be equally true in your industry.

"You should get a weekly analysis of the manufacturing burden showing the variances in each item between standard and used burden."

"You should get monthly reports showing"

"Profit and loss, that accurately measure all profits and losses,—"

"By classes of product, by territories, by salesmen, by customers . . ."

And in cases where it is indicated, by other classifications.

"Analyzed comparisons of actual expenses against a budget based on standards . . ."

And if a budget is not based upon a standard I don't believe it is a real budget.

"Analyzed comparisons of actual against standards in purchases of material . . ."

I don't think I need to say much about that. Much was said about it by your cost man this morning, about measuring the actual against the standard of materials. We believe that he is absolutely right.

"Report of inventories, of raw materials, work in progress, finished product, at standard costs."

QUESTION: How often should you have that?

MR. GROVER: At not longer intervals than once a month. Some of them are getting them once a week.

"Report of additions and withdrawals of plant items."

That may seem unimportant, but I don't think there is a man here, who is actually in the accounting game, who will not appreciate the importance of reports of this kind.

"All this valuable information is worth much more than it costs to get."

That is something I wish I could tell to the world, and I wish I had some way of driving it home. I have my troubles with the machine tool builders in driving this home and I am not home yet.

"If you get it and use it, you will increase profits by stopping losses."

Any cost information or, in fact, information of any kind, is of no value if it is not used.

"You will increase profits by showing where and how much improvement is possible."

"Standard costs will ring the profit bell that you didn't ring, Mr. President, in the past years of operation."

"Poor costs always cost too much."

MR. FRANK: I am sure that you will all agree with me that Mr. Grover has a plan of presenting his material to the executives of his industry that will readily and easily sell the idea of standard costs to them. After the other papers have been presented, we will have a general discussion period when you can bring up any questions you might have that bear upon the slides that Mr. Grover has shown you, or the papers presented by any of the other speakers.

As your president, Mr. James, indicated in his introduction, he asked me to come here and tell you of some of the experiences that we have had in the machine tool industry, as well as bring in some of the people from our industry and some of our other friends who are getting the desired results from the use of standard costs.

## ENGINEERING AND DEVELOPMENT COST STANDARDS

THOMAS B. FRANK
Treasurer
The Cincinnati Planer Co., Cincinnati, O.

IN the manufacture of machine tools we are compelled to face the proper and adequate control of three major activities—

1. Development and engineering.
2. Manufacturing.
3. Sales and distribution or marketing.

It is the first of these major functions, development and engineering, to which I shall confine my discussion this afternoon.

The first step in securing effective control of such activities as

designing new machines, and other Engineering Department activities, is to set up the Engineering Department as a separate production center, in the same manner as you would set up a production center in the shop. All the work done in that department would be considered as production for that department and would be costed on the same basis as shop production; i.e., labor costs plus the standard burden that has been determined for that department. This first step is very important, for without it a definite plan of setting cost standards or effecting control of the activities, is impossible.

The work of an Engineering Department may be classified into the following divisions—

1. New production—that is, new products which must be developed and designed.
2. Sales proposals.
3. Customers' or special contract work.
4. Regular production—design and drawings for products already designed and part of the regular product.
5. Production prints for the use of the plant.
6. Production fixtures.
7. Plant assets.

Let me clarify what I mean by those classifications—

*New Production* is the designing and preparation of specifications, prints, etc., necessary to the production of machines or other products that have not been made in the plant before.

*Sales Proposals* consist of engineering effort expended in making estimates and prints for the Sales Department needed in their work of securing orders.

*Customers or Contract Work* is the engineering work of preparing specifications and prints for special tools, fixtures, and other special work that is to be sold to customers.

*Regular Production* covers such engineering activities as are required to keep the regular shop production up to date.

*Production Prints* covers the work done in the Engineering Department in preparing prints and material lists for the use of the plant on regular production.

*Production Fixtures* covers engineering work on new production fixtures, tools, etc., for use in the company's plant.

*Plant Assets* refers to that work of the Engineering Department necessary to the preparation of design and details for the manufacture of equipment to be installed and used in the shop.

Please remember that this work is considered as direct production of the Engineering Department and the costs computed separately thereon. None of the charges for this class of work are to be considered as part of manufacturing burden as such.

In other words, in the past too many members of our industry, and probably of other industries as well, have lumped all their engineering charges and thrown that total into general shop burden and distributed it on some arbitrary basis, with the result, of course, of not getting the proper cost for any individual product or any individual kind of work that they may have done.

In order to attain the objective of the business, that of earning profits, it is very important that the cost of developing the various products be *pre-determined* as accurately as possible. For that purpose we have devised the "Development Cost Sheet", figure one. I think this form is sufficiently clear in itself, so I will not take the time for a detailed explanation.

First, we will consider the "Estimated Cost", or the cost standard for a particular part that is to be manufactured, part 15-A.

The factors to be considered in the predetermination of the costs are,

(1) Previous estimates, which are checked very carefully.
(2) Actual performance records of previous similar work.
(3) The best judgment of the engineering and production executives.

The Cost Department, where proper rate schedules are maintained, enters the cost of the respective material, labor and burden and extends them at the rates applying to the class of work required

| USED ON | | | |
|---|---|---|---|
| PCS | SYMBOL | PCS. | SYMBOL |
| 1 | 15-A | | |

## DEVELOPMENT COST

| | ESTIMATED COST | | | | | | | | | | | | TOTAL | | ACTUAL COST | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MATERIAL | | LABOR HOURS | | LABOR RATE | | LABOR AMOUNT | | BURDEN RATE | | BURDEN AMOUNT | | | | ORDER | AMOUNT |
| ENGINEERING — DESIGN | | | 30 | 0 | 2 | 50 | 75 | 00 | | 55 | 16 | 50 | 91 | 50 | 18752 | 87 40 |
| ENGINEERING — DRAFTING | | | 20 | 0 | 1 | 00 | 20 | 00 | | 55 | 11 | 10 | 31 | 10 | 18752 | 35 10 |
| PATTERNS | 8 | 00 | 15 | 0 | | 75 | 11 | 25 | 1 | 09 | 16 | 35 | 35 | 60 | 18801 | 27 45 |
| CORE BOXES | 3 | 00 | 3 | 0 | | 75 | 2 | 25 | 1 | 09 | 3 | 27 | 8 | 52 | 18801 | 9 65 |
| SPECIAL FLASKS | 1 | 75 | 1 | 0 | | 75 | | 75 | 1 | 09 | 1 | 09 | 3 | 59 | 18801 | 2 52 |
| SPECIAL JIGS DIES FIXTURES TOOLS | 5 | 50 | 12 | 0 | | 80 | 9 | 60 | 1 | 40 | 16 | 80 | 31 | 90 | 18816 | 24 16 |
| EXPERIMENTAL | | | 10 | 0 | 1 | 50 | 15 | 00 | 1 | 10 | 11 | 00 | 26 | 00 | 18818 | 20 00 |
| DEMONSTRATION | | | 3 | 0 | 1 | 50 | 4 | 50 | | | | | 4 | 50 | 18818 | 6 00 |
| TOTAL | 18 | 25 | 94 | 0 | | | 138 | 35 | | | 76 | 11 | 232 | 71 | | 212 28 |
| OPERATING GAIN OR LOSS | | | | | | | | | | | | | | | | 20 43 |
| CHARGE - SALES ORDER | | | | | | | | | | | MFG ORD. 16787 | | 7 | 31 | | |
| BALANCE OVER 490 PIECES AT | | | | | | | | | | | | | 46 | | EACH | |

REMARKS

PART NAME: Apron

SYMBOL: 15-A-1

FIGURE 1

at the rates prevailing for the departments and equipment where the work should be performed. This work pre-supposes the establishment of labor, material and burden standards for all production departments or centers.

On the form, figure one, it will be seen that the company engineers estimated, or set a time standard, on the job illustrated, as thirty hours for designing which is extended at the designer's rate of $2.50 per hour and the departmental rate of burden of fifty-five cents per hour, or a total standard cost for designing the part of $91.50.

The same procedure applies to the actual drafting work which comes to a total of $31.10.

For pattern cost the cost of pattern materials is added to the cost of the labor and Pattern Department burden. Likewise the cost of making core boxes is determined, also special flasks, tools, dies, fixtures, etc.

Some of our companies do not have foundries of their own. They have their pattern work and the work of making special jigs and dies and flasks done outside their plants, and, of course, we would consider that as so much purchased material and handle it on this sheet accordingly.

To this cost is then added the standard cost of the experimental work necessary to the proper development and approval of the item being worked on, and also the estimated cost of a practical demonstration of the new product or part. The sum total of all the estimates makes up the total cost of the development which, in the example, is $232.71. It is this cost that is charged to the future production of the unit developed as the management sees fit. The form provides for the amount to be charged to the current order and for the amount to be charged to future orders, or for whatever other disposition is deemed advisable.

You will find that amount in the next to the last line, where it says, "Charge—Sales Order". We have charged $7.31 of this cost to the manufacturing order number 16787, and the balance of this development cost is to be spread over 490 pieces at the rate of forty-six cents each.

These sheets are filed numerically by part numbers and are referred to for succeeding estimates of parts, assemblies or complete machines where the parts are used. The costs at standard are posted to the estimate sheets or the standard cost sheets, of

those parts, assemblies or machines. The "Used On" space at the top of the sheet indicates the product that the unit is used on, indicating it by symbol number and the number of pieces required. It will readily be seen that it is a comparatively easy job to make accurate estimates for all purposes when such a record is kept.

A special work order is issued as authority for all development work. This work order shows the estimated or standard hours allowed to execute the work, order number, customers order number, blue-print numbers, etc., as well as the details for the work to be performed. It is found desirable to have a separate order for each class of work to be performed, although one order may be sufficient if adequate methods are provided for the accumulation of the necessary information. All costs are accumulated on the back of the special work order at actual, which costs come from regular material requisitions, job time cards, etc. The Cost Department sorts the various cost items to conform to the breakdown of costs as shown on the "Development Cost Sheet" and posts the totals to that sheet. Therefore, the Cost Department posts the totals from the work orders to this sheet, in the last two columns which are headed "Actual Cost".

Assuming that we issued work order number 18752 for the design, that same order covers the drafting, but in the Cost Department's classification, they would separate them, with the design at $87.40 and drafting at $35.10. Then the patterns, core boxes, and special flasks were made on shop order number 18801 and the special jigs, and so forth, were made on order number 18816, while the experimental and demonstration work was done on 18818.

The separation of experimental and demonstration work may be open to question, but we find on a number of products it is desirable to know the separate costs. I think as a general rule one classification would probably be sufficient.

The total estimated or standard cost is charged to an account, "unapplied development cost". The variance between the actual cost and the pre-determined cost is charged to the operating profit and loss account. The management has previously indicated the manner of distribution of this development cost, whether they want to charge it to the current order against sales and get rid of it all at one time, or whether they want to set it up and spread it over future orders and future production of that particular product.

In the example it is assumed that the cost is to be charged

in two ways—$7.31 against manufacturing order number 16787 which is the first order the new part is used on and the balance of the cost spread over 490 parts at the rate of forty-six cents per part which is the number of parts the management expects to make. This is applied as the orders for the parts are run in the shop. As these charges to orders are made, a corresponding credit is entered to the unapplied development cost account. By keeping a record of the special order charges for development, an actual control of this account is kept and reconciled by the detailed unapplied balances, much in the same manner as perpetual inventory records show unused material balances on hand.

When parts or assemblies or machines are discontinued and there remains a balance in the unapplied development cost account as applying to that particular unit the cost sheets are removed from the files and the unapplied balance charged off to surplus account together with the costs of discarded patterns, materials, etc.

In these days of rapid expansion and development in machine tool designs, other machinery and other products, we find the management's guesses or their estimates are not so "hot", if I may use that expression, and sometimes there is a considerable amount of development cost that may have to be charged off as the product is superseded by a more modern design.

As I said before, all estimates or standards have to be based upon the best judgment of the people you have in your organization, people of experience and training along those lines. To my mind, that is the only way you can do it. The method outlined gives a good picture of results, compared with the estimates, good or bad, and is therefore a valuable tool of management.

The same procedure is followed with the estimated cost of "sales proposals". The disposition of the cost will depend entirely upon the decision of the management. Usually the cost is applied to the particular proposal being made, other times it is spread over a number of proposals made for similar products. In any event it is charged to marketing cost.

The same procedure follows for all development work in connection with the other functions of the Engineering Department as outlined at the beginning of this paper—customers' or special contract work—regular production—production fixtures—plant assets.

The beneficial effect of maintaining a system of standard costs for work of this character is that it places absolutely the responsibility for the estimates. When errors are made the necessary explanation becomes a part of the record and the standard is revised accordingly. If not, well, you know what happens when departments don't meet the standards that have been pre-determined for them.

It has been said by many, and for a good long time too, that it is impossible to place an Engineering Department on a time clock. We have been doing it for a long time and have been getting our time records without any difficulty and with a very high percentage of accuracy. By pre-determining the costs of development work, it places the engineer on his toes. He makes a sincere effort to keep his work within the estimates or to better them, for he knows that if he does not, he will be called upon to give very detailed reasons why and "how come".

We can heartily recommend that standard costs be used as a means of effectively controlling the costs of development and engineering activities, and as a means of assuring adequate return through selling prices for the amount of effort and money expended in development of products and special work for customers.

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MR. FRANK: In the National Machine Tool Builders Association, we have a number of companies manufacturing a large number of different products, from some of the very smallest machines and accessories up to the largest, some of which it takes possibly three and four railroad cars to ship one individual machine, ranging in value from $25,000 up to $100,000, or even more in some cases.

Some of these companies have made considerable progress in developing and using standard costs for manufacturing their products. We had planned to have with us today Mr. E. R. Smith of The Seneca Falls Machine Company, Seneca Falls, New York, one of the members of our association who has done an outstanding job in his particular plant with the use of standard costs as a means of effective control of his manufacturing activity.

Last night I received a wire from Mr. Smith stating that illness in his family would prevent his being with us today. Needless to

say, I was very muh disturbed upon receiving that telegram, but it wasn't very long after I had seen Mr. Fletcher and your president, Mr. James, that I began to feel a whole lot better because they told me they had a gentleman here in Pittsburgh who they thought would read Mr. Smith's paper. I think most of the Pittsburgh people know him as well as many of the rest of you, as he is a national director of the N.A.C.A.

He is the director of budgets of the Westinghouse Electric and Manufacturing Company. I should like to introduce to you Mr. A. W. Bass who will read Mr. Smith's paper on "Standard Costs for the Control of Manufacturing Activities".

## STANDARD COSTS FOR THE CONTROL OF MANUFACTURING ACTIVITIES

E. R. Smith

Vice-President

Seneca Falls Machine Company, Seneca Falls, N. Y.

I HAVE been asked to express my ideas regarding the value of standard costs to the executive, and also to describe a few actual cases showing how standard costs work out at the Seneca Falls Machine Company.

Many manufacturing expenses may be controlled by standard costs. It seems best however, to confine my remarks to the value of standard costs in keeping direct labor costs within bounds. If standard costs accomplished nothing else but this they would still be a worthwhile aid to management.

Perhaps the best way to illustrate the advantages of standard costs, or, as I like to call them, "pre-determined costs", over the old method of cost finding is by drawing a comparison.

Before we adopted standard costs we had various systems in operation ranging all the way from straight day work to a glorified incentive system. These systems were always backed up by an elaborate Cost Department. We depended on the foremen to get the work finished in the most economical manner. When using wage incentive systems we depended on the operators' desire for money to help the foreman. After an order for a group of machines was completed the Cost Department prepared a summary

sheet showing the cost of material, labor and overhead for the machines in question. This was supplemented by a break-down sheet showing the cost of the unit assemblies. This in turn was supplemented by cost sheets showing the cost of the unit pieces used in the assemblies.

If we had previous costs on the machines in question we had a sort of standard with which to compare the last cost. As a general thing, if it showed a reduction, we were satisfied. If the summary sheet showed the cost to be much higher than previous costs we would look at the unit assembly costs and find out which ones were high. Then we would study the unit part costs. Thus we could find which parts were high and, with a lot of analysis work, we could find out why they were high. But what good did all this expenditure of effort do us? The money had been spent and we couldn't get it back. Our Cost Department was simply giving us history. It couldn't aid to any great extent in lowering production costs.

Compare this to conditions when working with standard or pre-determined costs. In using this method we split the work to be done on each individual part into operations and pre-determine the amount of time each operation will take and the rate we will pay for it. Usually the length of time allowed for the various operations is determined without a stop-watch time-study. In other words, we have gathered enough data so that the allowed or standard times can be quickly determined. Perhaps these are not as accurate as they should be if we were making a great many pieces of the same thing. However our line is quite diversified and it does not pay us to spend money splitting hairs.

The amount of money or rate we will pay on the operation is determined by the skill required for the job—that is to say, an operation requiring a hole to be jig-drilled would carry a lower rate than would an accurate operation requiring a set-up on a boring machine without jigs or fixtures.

We have found it advantageous to break down all of our work into operations and to set standard times and standard costs. This holds true whether the order calls for one piece that will never be made again such as special tooling or two or three hundred pieces that will be coming through again in a few months.

With each job, as it goes to the shop, is an operation or route sheet which shows the sequence of operations as they are to be per-

formed and also shows the standard time and the standard rate per hour for the operation. First of all, this sheet acts as a guide in assigning the work to various machines and operators because the standard rate indicates the type of operator to which the job should go.

When the operator starts the job he has before him the standard time which he must make. He also can determine by multiplying the standard time by the standard rate what the job should cost. If his rate is higher than the standard rate he knows he must work faster. His instructions are to meet the standard costs or stop the job and report to his foreman. It is the foreman's job to see to it that the standard cost is met or determine why it cannot be met before spending more money on the job.

Sometimes it develops that something on the job is not right. The material may be too hard or too much stock may have been left for finishing, or perhaps the machine needs adjusting. In any event, the foreman has an opportunity to correct the trouble and meet the standard cost. He knows that all excess cost is a factor which is considered in determining his efficiency as a department head.

Of course the standard costs are not always made but at least we have an opportunity of trying to meet the standard. If we don't meet it it is because we have decided that it is more expedient to exceed the standard costs. For instance, if the operation consisted of machining a casting that was warped, therefore requiring more time for the operation, it probably would be wiser to exceed the standard costs for the machining operation rather than get a new casting.

Theoretically the above system should make it unnecessary for the Cost Department to determine direct labor costs. Unfortunately, however, it is necessary to have a control or check on operations and this makes it necessary to gather information for checking purposes.

Our method of doing this is to segregate the cost of work performed on the various lines of machines we build. When a lot of machines is completed we show the standard or pre-determined cost and also what the actual cost was. If these two figures are close no more attention is paid to the cost. If, however, they are far apart we may want to analyze the job further in which event we can compare the standard and actual costs on the detail parts. As a

general thing, however, this is never done because the money has been spent and there is no use worrying about it.

Each week a tabulated sheet shows the standard and actual costs of work coming out of the various departments. This checks any serious deviation from the standard costs. It immediately shows us whether or not a foreman is on his job. If standards have been maintained in a satisfactory manner while the work is going through the shop there is no need of worrying about costs after the job is completed.

To illustrate, if a man driving an automobile should run into a post and bend a fender he would undoubtedly find out whether or not it could be fixed and what it would cost. He would then have the job repaired and pay the bill. It wouldn't interest that man very much nor would he spend very much money to have someone remind him four to six weeks afterward that he ruined a fender on his car and tell him what it cost to have it fixed.

Perhaps a brief outline of one or two instances that actually happened in our plant will illustrate how pre-determined costs help us eliminate waste effort.

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MR. BASS: I think the most important part of Mr. Smith's paper is his discussion of actual cases. What preceded was a good deal along the line of general suggestions which we have all heard at previous conventions. It is educational and desirable, but he has gone a step further here than many of these previous presentations have gone, and shown how these things have actually worked out in practice and how we get the control in standard costs.

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*Case No. One:* Order for one thousand dog jaws, material 1" square tool steel. The operations on this piece call for cut-off and three milling operations. On the first milling operation the operator discovered that his milling cutter wouldn't stand up to the speed and feed necessary to make the standard costs. The foreman investigated and found some of the pieces were harder than they should be. *Remedy*: The pieces were tested for hardness and the ones soft enough allowed to go through the milling operation. The ones that were too hard were annealed. *Result*: Milling cost was kept to standard instead of being more than doubled. Inciden-

tally, on the next two milling operations standards were easily met. Under the old system the operator probably would have run the job as fast as he could and while the job would cost more than usual he wouldn't know the difference and neither would the management until after it was too late to save the money.

*Case No. Two*: An order for fifty cast iron guards. Material, grey iron, very thin section. Operations drilling hinge pin holes approximately 3/16″ diameter and two or three other small holes.

This job was stopped because the workman couldn't make standard time due to the castings being hard. Under the old system he would have worried the job through some way and probably used up a lot of drills in doing it. Under our present system the job was held up. An investigation showed the cause of the trouble. The castings were returned to the foundry and were annealed by placing them in a large bull ladle after the day's heat, then covering them up. This annealed them sufficiently so that the job was ready to start again the next day and standard costs were met.

*Case No. Three*: Assembling gear box for Model R lathe. The study of this job, which was made without watching the job in process, indicated that the total time shouldn't exceed one and one-half hours. This was used as standard. When this job went to the assembly floor it was stated standard time simply couldn't be met as it had always taken four to six hours to do the job. A check-up of previous costs showed this to be true. Nevertheless there was no reason why it shouldn't be done in one and one-half hours and the foreman was instructed to find out what prevented him from doing it. He discovered that it never did take more than one and one-half hours to do the actual assembly work. The rest of the time was being spent in fitting and scraping which was made necessary because some of the limits were wrong on the drawings. *Result*: Drawings changed and two hours per machine saved.

I haven't dwelt on the other uses of standard costs because it seems that the advantages shown should be sufficient to cause anyone at all interested in reducing manufacturing expenses to give careful consideration to the adoption of this system of control.

It might be well to mention one other point before closing. A system of standard costs like any other system or method, is simply a means to an end. We should never forget that our main object is

to produce whatever we are building as economically as possible—quality considered. The standard cost method of controlling expenditures is valuable so long as it helps reduce manufacturing costs. It would be very easy to install an elaborate system that would be top-heavy and unwieldy. Such a system might cost more to operate than it saved.

It doesn't seem necessary to install an elaborate system to start with. Quick results can be obtained by simple methods. The system can be expanded as the need for such expansion presents itself.

MR. FRANK: Thank you, Mr. Bass. The Cincinnati Chapter certainly appreciates your cooperation, as well as the cooperation of the Pittsburgh Chapter, in helping us in the presentation of this particular paper.

We have tried to give you some actual experiences in the selling of standard costs, for their use in development and engineering work, and for controlling manufacturing operations, yet there is still one more function of any business enterprise that is just as important, and in some cases more so, than the two we have already discussed. That is the sales and distribution or the marketing of your product. It is just as important to set standards for that class of work as it is to set them for the engineering and manufacturing.

For the discussion of this particular topic, we felt we would like to get away from the machine tool industry and draw upon another industry that is located in the southwestern part of Ohio, prominently known throughout the country, that has done an outstanding job on this particular class of cost work. This company, the American Rolling Mill Company, is in a business closely related to the machine tool industry.

I would like to introduce Mr. E. J. Goldschmidt, Jr., controller of the Armco International Corporation, the export division of the American Rolling Mill Company of Middletown, Ohio.

# STANDARD COSTS FOR THE CONTROL OF DISTRIBUTION ACTIVITIES

E. J. GOLDSCHMIDT

Controller

Armco International Corporation, Middletown, Ohio

I HAVE been called upon to show to you the use to which standard costs can be put as a means of putting the Naca company once again upon its feet and in its proper place within our industry.

First, I would like to ask you whether or not we would refuse any orders for our standard products because, due to the depression, our costs, if they were actual, are too high? Strange as it may seem, in times like the present, costs do not make the selling price. It is competition that dictates the prices at which we will sell our products. You gentlemen know without being told that our overhead at present is double what it would be if we were operating at 100 per cent capacity instead of fifty per cent and it keeps us scrambling to maintain the fifty per cent operations.

Our business is not an overnight business, but is a permanent affair and something you as stockholders and directors wish to keep going. In view of this, you realize there are times in every period of the business cycle when we will lose money. Therefore, we are interested in what our products are costing over a period of normal operations which includes the good with the bad, and, at the same time, in keeping our losses at a minimum during times like the present.

While it is true that our losses will be the same regardless of what kind of a cost system our accountant sees fit to install, nevertheless we must not lose sight of the fact that if we were to base our sales campaign upon what actual costs are, we would close up shop and go home, for with the fifty per cent operations we are maintaining we are not covering our costs. The strange thing about these depressions is that sales prices always go down while costs go up, and it is perfectly obvious that unless we know the costs of our products over a normal period of operations, we would discontinue the sale of some, thereby losing markets to our competitors which would not only be difficult to re-establish, but would be a waste of all the time and money your Sales Department has spent upon their development in the past.

So much for generalities. I will now deal with specific cases to show how these standard costs are going to help us and, while in principle they are the same, their application may differ.

As you gentlemen know, we manufacture some forty products. There were considerably more before we established our standard cost system or normal production cost which proved to us that over a period of one business cycle a goodly number were unprofitable and for that reason they were eliminated from our price quotations. Of those eliminated there were originally some twenty-six of which six have been reinstated. These six were given considerable study by our Development Engineering Department in cooperation with our Works Accounting Department, and ways and means were developed for their production which took them out of the loss class and put them into the profitable class. I merely mention this to show the close cooperation we are securing from our Development Engineering and Works Accounting Departments. They are making further studies of the remaining twenty items and it is hoped that a goodly number of these will again be added to our profit-producing line.

You may question how we use the normal costs of these forty items to advantage and just what effect they will have on your sales organization.

In the first place, let me say that the costs of these items are not passed on to the district managers in the dollar and cents form as we do not believe it to be conducive to the proper psychology. We do, however, divide our forty items into profit classes as follows:

Class A—Items on which we make works costs, including depreciation.

Class B—Items on which we make our works cost plus selling and administrative expenses.

Class C—Items on which we make works cost, selling and administrative expenses, interest and dividends.

Class D—Items on which we make works cost, selling and administrative expenses and ten per cent on invested capital.

Figure one shows the number of products here. There should be a line coming down from A, B, C, and D. Line A represents our manufacturing cost, that is our work cost.

Line B represents our works cost, plus selling, administrative, and management expense.

Line C represents the works cost, selling, administrative, and management expense, plus our regular dividends and interest.

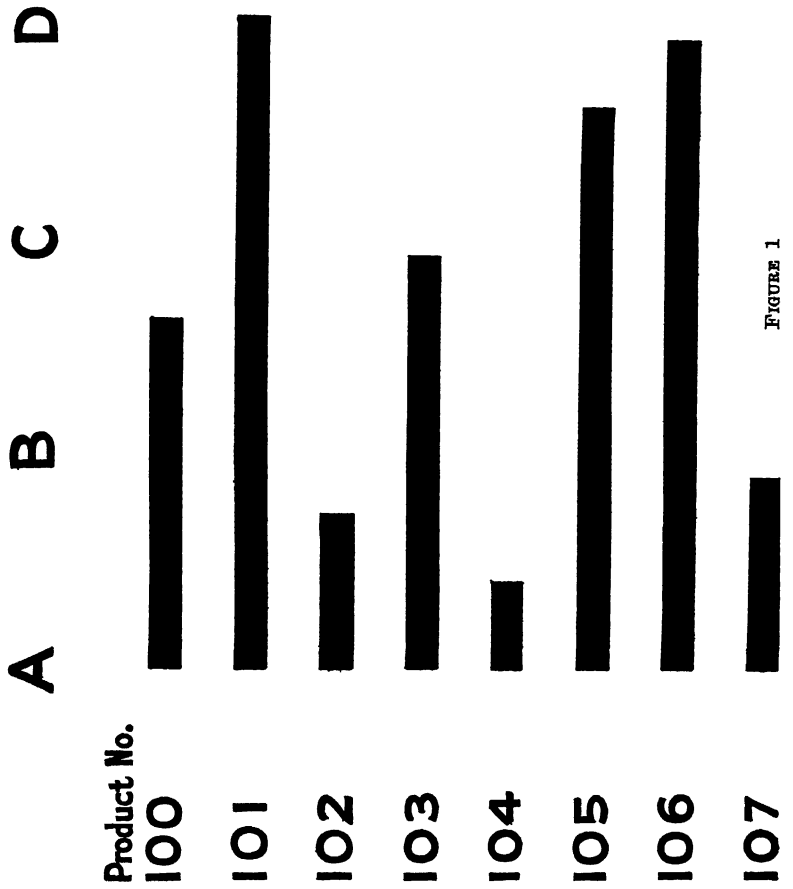


FIGURE 1

Now, line D is the goal which we hope to attain. It represents all our expenses, plus ten per cent on invested capital. I don't think anybody can kick if we make ten percent on our invested capital.

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THOMAS J. BURKE: Is that in addition to dividends?

MR. GOLDSCHMIDT: No, dividends come out of the ten per cent.

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This is sent out to the salesman. The salesman knows that on all those items he sells we are making our works cost, our selling, administrative, and management expense, and part of our dividends. If we were making all of our dividends, the line would come out to there. (Indicating line C on chart)

On product number 101 we are making ten per cent on invested capital over and above all expenses.

Here is an item, number 107, on which we don't quite make our selling and administrative expenses, and so on down the line.

We send those out whenever the prices are changed.

Armed with this information, the district manager knows what his efforts are bringing in general, while at the same time he is not harassed with conflicting emotions so often caused when the dollars and cents are shown. These classifications are revised from time to time as sales prices change. This also has a moral effect upon the salesman to combat with vigor the downward tendency in prices, for when he receives a new classification he can note the movement of the various items to the lower profit bracket. In other words, with product 100 we may have a ten per cent reduction in sales price. The next time the salesman receives that chart, it might show that we are just barely making our selling and administrative expense. These are some of the uses we make of the application of standard or normal costs to our products.

The question now arises as to the use of standards for distribution expenses. In these we have a difficult problem. As you know, our district offices are located in fifteen different cities as well as eight foreign countries. How, then, are we going to set standards for all of these under different conditions and with different personnel? Will we set the standards from the home office? My answer is emphatically—No! You look askance at this statement and may well wonder why. My answer should have been one of Andy's (you all know who Andy is) "yes and no". By this I mean we will only dictate the policy from headquarters and depend upon our district managers in carrying out the detail, for, after all, we employ a district manager to handle the district affairs and for us to tell him how much he should spend for traveling expense, entertainment, stationery and office supplies, would be not only ridicu-

## NACA MANUFACTURING COMPANY—XYZ DISTRICT BUDGET FOR 1931

| | Actual for 1930 | | | Budget for 1931 | | |
|---|---|---|---|---|---|---|
| | Amount | Unit Price | % of Sales | Amount | Unit Price | % of Sales |
| Net Sales | 200,000. | 100.00 | 100.00 | 240,783. | 95.00 | 100.00 |
| Cost of Sales | 170,000. | 85.00 | 85.00 | 202,763. | 80.00 | 84.21 |
| Gross Profit | 30,000. | 15.00 | 15.00 | 38,020. | 15.00 | 15.79 |
| District Office Expense | 15,000. | 7.50 | 7.50 | 12,000. | 4.73 | 4.98 |
| Commissions | 5,000. | 2.50 | 2.50 | 6,020. | 2.38 | 2.50 |
| Total District Selling Cost | 20,000. | 10.00 | 10.00 | 18,020. | 7.11 | 7.48 |
| Home Office & Capital Charges | 25,000. | 12.50 | 12.50 | 20,000. | 7.89 | 8.31 |
| Total Overhead | 45,000. | 22.50 | 22.50 | 38,020. | 15.00 | 15.79 |
| Profit or *Loss from Operations | 15,000. | *7.50 | *7.50 | 0 | .00 | .00 |
| Number of Units | 2,000. | ..... | ..... | 2,535. | ..... | ..... |

Method of arriving at sales necessary to break even:

Based on 20% reduction in Expenses, Districts Estimate of Sales Prices and Works Accounting revised Standard Costs.

$$\text{Sales 2000 Units} \times 95.00 = 190{,}000.$$
$$\text{Cost 2000 Units} \times 80.00 = 160{,}000.$$
$$\text{Gross Profit} \qquad 30{,}000.$$
$$30{,}000/190{,}000. \qquad = 15.79\%$$
$$15.79\,x - (12{,}000 + 2.50\,x + 20{,}000.) = 0$$
$$13.29\,x = 32{,}000.$$
$$x = 240{,}783.$$

Figure 2

lous, but we would lose the value to be gained by having him study his own problem and make his own decisions; for, after all, we have hired him as a manager and not a chief clerk. Let us let him function as a manager.

Figure two represents a budget set for our XYZ District. Starting out with our budget, we told the district managers that certain expenses would have to be reduced in principal.

How then will we get this control? The answer is more simple than you think. First, we have studied in detail our various districts as to their potential profits and have decided from our figures of 1930, in conjunction with the outlook for 1931, that to break even—and I believe you gentlemen will agree that if we break even in 1931 we will be doing wonders—we will have to reduce our sales expenses by twenty per cent.

This twenty per cent was arrived at by a study with our cost accountant and involves a lot of complications and might have been thirty just as easily. This is the policy we will dictate to our district managers, that is, they will have to reduce their expenses by twenty per cent over those for 1930.

What happens? The district manager sits down and studies his expenses in detail and is amazed at what some items are costing and does the very thing we wanted him to do by taking the necessary steps to eliminate some of the items which we at headquarters have felt to be out of line, but not being on the ground and not knowing the full details have been unable to definitely state that they must be cut down. I said "must" which is quite different to saying "should".

The next step is to study his markets and here again we ask the district manager to give us his potential markets together with probable sales prices for the sales of our forty items. We now have the district manager completely hogtied three ways and the only ways for which he can be held responsible, namely:

1. Committed himself as to what his expenses should be, by the acceptance of our policy to reduce expenses tweny per cent over 1930;
2. Committed himself on what his potential sales are to be;
3. Committed himself on what prices he should receive.

On the expenses we have dictated the policy which, after his acceptance, becomes his standard for the year. On the sales and prices he has accepted the responsibility, which is far better than for us to sit back home here and try, by looking at previous years' sales, to set his standard, for, after all, he has his hand upon the pulse of his district—and don't forget I am speaking of managers the type of which we are fortunate to have.

We now have all the elements for setting up his yearly standard —budget, goal, target, bull's-eye, I care not what you call it, for a rose by any other name is still a rose. These elements consist of—

Costs by products
Sales by products, both quantity and price
District expenses.

Figure two shows what his district did for 1930. This particular manager had $200,000 worth of sales, and so on down the line. His expenses and other items were the various amounts shown.

The unit price—that can be piece or ton or dozen or gross or anything—was this. (Indicating) His expenses of sales were these. (Indicating). Now, he has sent in an analysis of what he expects his sales to be—potential tons—at the various prices, from which we arrived at an average of ninety-five dollars. Using our standard costs applied to these items, we arrive at an average cost of eighty dollars.

We took his district office expenses for last year and said he must reduce them twenty per cent, so they were reduced twenty per cent. The commissions would automatically increase or decrease with the sales, as we have certain arrangements with agents that if their sales increase their commissions increase, and if they decrease their commissions decrease.

The home office and capital charges we expect to reduce twenty per cent by cutting our own administrative and management expense and various other items.

So we have to start with the average sales price of ninety-five dollars, the average cost of eighty dollars, and that gives us what the gross profit will be on that basis. So we worked out a number of units, times ninety-five dollars, which gives us $190,000. The cost at eighty dollars gives us $160,000, and a net profit of $30,000. $30,000 divided by the net sales gives us 15.79 per cent. We are now ready to work the balance of the figures.

The only figures we have available to begin with are these figures here. We don't have this one and we don't have this one (indicating sales and expenses), but we have the percentage of profit and we can then make an equation.

$$15.79\ x - (12{,}000 + 2.50\ x + 20{,}000) = 0$$

As we stated, we expect to break even. Therefore, $x = \$240{,}783$, the amount of sales that this division must sell at this price, with a cost at this level and a gross profit of 15.79 per cent, with a twenty per cent reduction in district office expense, with commissions at the same rate they were last year, home office and headquarters charges reduced twenty per cent, to bring the division manager down to no profit or no loss, which we are setting as our campaign for this year.

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MR. BURKE: What do you include in your "home office and capital charges?"

MR. GOLDSCHMIDT: That would be administrative, management expense, and interest, and your regular capital charges such as dividends. You can't cut down your dividends unless your directors say so, but you can make a saving in administrative and management expense and various overhead expenses.

MR. BURKE: What is district office expense?

MR. GOLDSCHMIDT: We want to find out the net results of the district.

In other words, we are going to try to make all our districts stand on their own feet. The matter of distribution is up to our cost man. There are a lot of things involved. For example, you might be able to cut down those capital charges. You might change preferred stock for either notes or common stock. That depends upon the stockholders.

MR. BURKE: If you show your dividends in your cost, though, you do make a profit.

MR. GOLDSCHMIDT: They are below cost. In other words, here is our gross profit, our plant profit.

MR. BURKE: You have "profit or loss on operations" down below at zero, while you say you have included an allowance for dividends in the home office expenses. If you have included dividends, you must be making a profit.

MR. GOLDSCHMIDT: You are speaking of this as a balance sheet. I am speaking of it as a budget for our Sales Department. In other words, we really have a profit from operation as an accountant looks upon it. That is, anything over expenses is considered a profit from operations. We are considering it as a profit from operation of the district itself.

MR. BURKE: Taking the dividend as a part of the cost of operation?

MR. GOLDSCHMIDT: The dividend is in here, "home office and capital charges".

We are trying to make the district manager responsible for reducing the expenses and producing enough profit to take care of the dividends and the interest charges. Unless he does that, he is not producing a profit from the operation of his district as a district.

MR. BURKE: But I don't agree with that set-up on that basis.

MR. GOLDSCHMIDT: One thing you have to do is to look at a budget or goal set up for a Sales Department or a sales manager in charge of an office, in an altogether different light than you do from a management point of view. We are using this as a stimulant for the Sales Department.

The gentleman does not agree with taking the capital charges into the statement.

MR. BURKE: I disagree with putting the dividends in the capital charges and then stating you don't make any profit in the operation.

MR. GOLDSCHMIDT: You are thinking of profit from operations of the plant, while I am talking about profit from the operations of a sales district. There is a distinct difference.

MR. FRANK: May I suggest that you continue reading your paper, and we can carry on with the discussion after the completion of the paper.

MR. GOLDSCHMIDT: I believe we can change that word, operations, to some other name, and I think that will satisfy the gentleman.

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Now you may well ask, now that we have all this material together, how is it going to run the plant and how is it going to secure orders? Well, if I know anything about human nature, it is going a long way to accomplish just that thing, for no matter how poor or good business is going to be, we are going to get more of our share of the business with it than without it. You still ask why and I say, because we have the right type of managers who, after committing themselves to do a specific job, are going to move heaven and earth not only to accomplish the job, but to show the boss back home that when he says he can do a job, he will surpass it if humanly possible.

The question now comes up of keeping the managers informed currently. This will be done by making comparisons monthly with the standard, showing just wherein the gains or losses took place. These reports will be made for the month and year to date and gotten out as soon as possible. This quickness is important and is very ably assisted by the use of standard production costs of our products; and, by the way, the district will not be penalized by the variation in the costs as this is an operating charge over which the district manager has no control and, if included, dampens his enthusiasm, as he thinks "What's the use—I make the money and the factory loses." So give credit unto Caesar for that which is Caesar's.

Figure three is a statement that our vice-president in charge of distribution will send along to the district managers for comparison, making no comment other than what is stated here, "The attached exhibit is a comparison of the actual performance . . . "

NACA MANUFACTURING COMPANY

From: John Doe, Vice Pres. in charge of Distribution
To: District Managers

Budget Comparison for.....Months Ending.....

The attached exhibit is a comparison of the actual performance for the ..... months ending ....., 1931, with the budget for the same period.

Your sales performance was (over) (under) budget .....%

Your tonnage performance was (over) under) budget .....%
Your district office expense was (over) (under) budget .....%

Your headquarters and capital charges were (over) (under) budget .....%

FIGURE 3

"Your sales performance was (over) (under) the budget a certain per cent."

If you tell the district manager that his sales are under the budget, he knows he hasn't accomplished what he should and there is no use of telling him any more. If he is over, there is no use of patting him on the back, because he is only doing what he is being paid for.

"Your tonnage performance was (over) (under) the budget..."

Tonnages are shown because price may influence the figures one way or the other.

"Your district office expense was (over) (under) the budget..."

If you tell him it was over he knows something is wrong and it is up to him to take the necessary action to correct the situation.

"Your headquarters and capital charges were (over) (under) the budget . . ."

From this figure, he knows whether he was making dividends for the company as far as his office was concerned.

Figure four is a comparison which we will send along with the letter that merely states his sales and net cost of sales, the actual for the period, the amount, the unit cost, and the per cent of sales, and the budget for the period.

Now he has the detail as to his sales. He has the detail to the original budget set-up. He can analyze that and see on what items he fell down and on what items he oversold. The cost of sales will vary only with the quantity and mixture sold, because we are going to use standard costs and he is not responsible for the standard costs.

## Budget Comparison for_____District
## Months Ending

| | Actual for the Period | | | Budget for the Period | | | Profit |
|---|---|---|---|---|---|---|---|
| | $ Amount | per Net Ton | % of Sales | $ Amount | per Net Ton | % of Sales | Gain or Loss over Budget |
| Net Sales | | | | | | | |
| Cost of Sales | | | | | | | |
| Gross Profit on Sales | | | | | | | |
| Royalty Received | | | | | | | |
| Total Gross Profit | | | | | | | |
| District Office Expense<br>Commissions<br>Net Income Debits & Credits | | | | | | | |
| Total District Selling Cost | | | | | | | |
| Headquarters & Capital Charges | | | | | | | |
| Total Overhead | | | | | | | |
| Profit or Loss from Operations | | | | | | | |
| UNITS | | | | | | | |

FIGURE 4

District office expense and commissions, etc., go to make up the total district selling cost. It is very important that you show your district managers what your commission rates are, because sometimes they will make some very, very funny commission arrangements if you do not watch them.

Then we come down to the total overhead and profit and loss from operation, and down here we show it by units. We make that

out for the month, and if the report is for June, we make it out for the six months, making it cumulative to show the effect over a long period as well as monthly.

In conclusion, gentlemen, let me state that this represents my opinion and suggestions for setting standards as applied to the problem of improving our distribution methods, and it cannot be considered as a panacea for all business ills, as it is an absolute fact that there are places where standards can be applied with great economy and saving and other places where they would not work quite so well. I am speaking of the proposal I am making to you gentlemen as stockholders and directors of the Naca company, for a standard of some kind or other is good for all business; in other words, the principle is right while the application may differ.

MR. FRANK: When Mr. James invited me down here to speak, I had no hesitancy in accepting the invitation. We indeed appreciate this opportunity of appearing before the directors of the Naca Manufacturing Company and of presenting some of the practical plans of the National Machine Tool Builders' Association and the American Rolling Mill Company in the practice and application of standard costs. We hope that you have received something of benefit to you, something that you can use in the future development of your own business.

MR. JAMES: Mr. Frank, Mr. Goldschmidt, and by proxy, Mr. Smith over here, we thank you. Your part of the program has been very profitable and very interesting. We have about twenty-two minutes for a discussion of the papers that were presented this afternoon. Let's go right ahead with a very breezy discussion here so we can get in as much as possible in that short time.

J. R. WYLLIE (*Controller, The Standard Stoker Company, Inc., Erie, Pa.*): I would like to ask Mr. Frank why he charges $7.31 to the first piece.

MR. FRANK: Production order number 16787 calls for a certain number of parts. We figured that if they ran, say, 255 of those parts, that would be all we would ever use, and therefore we have charged thirty-five of them to the first production order that went

through, number 16787, and the balance remains to be absorbed on some other order.

R. M. SABIN (*Cost Accountant, Walker Manufacturing Company, Racine, Wis.*): I would like to know how you accumulate your labor variations and your material variations from standards. From your discussion, I gather that your standards represent what a scientifically developed estimated cost should be. Am I right on that point? In other words, you are looking at your estimate to follow through the whole production program. I want to know where the variations in labor and the variations in materials are recorded. Do you gather them daily, weekly or monthly, or do you use certain formulae to arrive at certain results?

MR. GROVER: Let's take the case of material first. When we order material, it is done through the medium of a requisition or bill of material, or any indication that might come to the management that they needed a certain amount of material. In most cases, the standard has already been established. When we receive that material, we put on our record both the actual and the standard, and as we pass those invoices, we report daily to the management that variation between the actual cost and the standards that have been set.

MR. JAMES: May I clear that up a bit? You say we report daily to the management. Whom do you mean by we?

MR. GROVER: The Cost Department.

MR. JAMES: Where do they get the information; from an invoice?

MR. GROVER: They get the actual from the invoice and the standard from the standard record on file.

MR. JAMES: Who makes the standard record, the specifications for the particular piece of apparatus you are making?

MR. GROVER: The standards are established largely through coordination of the Purchasing Department and the Cost Depart-

ment. It would take a lot of detailed explanation to tell you how it is done in every case because in some cases the Purchasing Department, in some cases the Engineering Department, and in some cass the Cost Department are in charge of that work.

MR. JAMES: Is that as to price or quantity required?

MR. GROVER: As to price, and if quantity enters into the consideration, of course the quantity must be specified under which certain prices will prevail.

MR. SABIN: Then I would understand the variation of prices would be written off, as far as accounting is concerned, at the time the invoices pass through.

MR. GROVER: As near as possible, or within twenty-four hours from the time of the receipt of the goods.

MR. SABIN: And from there on it is a matter of accounting procedure.

MR. GROVER: It goes into inventory at standard, and we have already taken the variance at that time.

The variance in labor is taken care of in this manner: All of the standards by operations, in most cases, are carried upon the standard cost sheet. In other cases, those standards are carried upon what we call the bill of material, or rather the specification sheet showing the operating to be performed upon the part.

These times or standards are placed upon the time card, or the job ticket, as we call it. When it goes into the shop and when this actual time is accumulated upon this card, both the standard and actual time and money are placed upon this ticket. Like material, they are reported to the management each day.

MR. SABIN: Then you get the information as to variances daily?

MR. GROVER: Daily in both cases.

R. B. SERVICE, Jr. (*Supervisor, Factory Accounting Depart-*

*ment, Norton Company, Worcester, Mass.*): I assume, Mr. Grover, that you are carrying your inventories at standard cost.

MR. GROVER: That is correct.

MR. SERVICE: Then let us assume that we have a lot of 1,000 parts which we may have produced and which we are carrying in our inventory at standard cost. And then someone comes along and shows us that by investing in new machine tools, we can reduce this cost, material and labor will be less, and overhead will be reduced. We elect then to make that investment and to proceed to manufacture the next lot of parts and get them into our inventories. What effect will that have in your inventory account?

MR. GROVER: For the first or the second lot?

MR. SERVICE: Both.

MR. GROVER: The first lot is still carried at the old established standard, but I should say if that ran into any great amount, I think I should change my standard and re-establish my inventory and take my loss, or take my gain, whichever it might be.

MR. JAMES: In that connection, this morning Dr. Reitell advocated that all inventory adjustments due to revision of price to bring your current inventory down to the latest market or cost price should be written off; if it is a loss, either to a previously established reserve created out of overages, or to profit and loss if there is no such reserve. On the other hand, if it is a gain, then it should be credited to a reserve to be utilized to absorb subsequent losses.

R. B. DEAN: (*Secretary, Eastern Steel Castings Company, Newark, N. J.*): May I ask, Mr. Grover, why there should be any variation in material charges, standard to actual, if the bill of material is priced at the invoice cost?

MR. GROVER: How often does that happen? It doesn't happen often in our industry only on special parts.

MR. JAMES: I think I can answer that. This gentleman is in the castings business and the castings business has almost a monthly turnover. That is to say—I think I am right in this—standards are established on the basis of material commitments for a period of time that is practically equal to one month's turnover, whereas in the machine tool industry, commitments for materials are made in anticipation of an operating period considerably in advance. Material is then put into the inventory and carried over a long period of time. So we have a fundamental difference between what we might call an immediate turnover business like yours, and the machinery builders' business.

MR. GROVER: We do have that condition, but it exists in so small a part of our business that we like to treat it on the other basis. We always have the opportunity of making our standard and our actual the same when it does actually happen that way.

W. C. KOEHLER (*Supervisor of Costs, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.*): You have explained to us the detailed information which is given periodically to each district manager. Now the point that I would like to bring out for my own information is simply this: Why give the district manager all of this information when he can control only a few of the items in these detailed comparative statements?

I am assuming, for example, that your district manager cannot establish prices. I am also assuming that he is primarily responsible for obtaining a volume of business in his district at established prices, and at a pre-determined cost of selling. In the discussion this morning it was brought out that you should charge the man only with the things which he can control. Therefore, why not give the district manager just two things: a volume of business for which he is responsible (which volume is based on commercial research) and secondly, a budget at which the volume must be sold? Why give him a mass of information when he is responsible for only a few of the items which are reported in those statements?

MR. JAMES: The question, as I understand it, is: "Why give to a district sales manager a budget based upon the profits derived from the sales effected by his district when, as a matter of fact, or at least it is assumed as a basis for the question, the

district sales manager has no voice in setting prices and he has no control over a majority of the items on the budget that Mr. Goldschmidt presented?" May we have the budget figures on the screen?

MR. GOLDSCHMIDT: It is true that we have quite a few items in there over which the district manager has no control. Nevertheless, I would like to ask this question: Where does your profit come from? It comes from your sales in your various districts. Now, unless you allot a certain amount of profit to your district, you don't instill in the district manager his full responsibility, and it is true that while he doesn't have control over sales prices, he does have some control in fighting and attempting to keep the prices at an even balance.

One of the gentlemen up here didn't agree, I believe, with the term, "profit and loss from operation". That does not mean the profit and loss from the operation of the plant. It means the profit or loss from the district itself.

MR. BURKE: I didn't say anything about profit and loss from operating. You said you included dividends in the home office and capital charges. If you include dividends, (I take it you mean the Naca Manufacturing Company dividends) you have a profit in there and yet you show it as no profit.

MR. GOLDSCHMIDT: When we speak to district managers of profit and loss, we are talking about surplus. Perhaps if I had made that "surplus" you would have agreed with it then, wouldn't you?

MR. BURKE: You couldn't have a surplus from operations.

MR. GOLDSCHMIDT: It is surplus from the operations of the district, not the plant.

MR. BURKE: It doesn't matter. I merely wanted to state my point of view.

MR. GOLDSCHMIDT: It wouldn't hurt to change it. The point is well taken.

J. A. PETRICK (*Cost Accountant, Kellogg Switchboard & Supply Company, Chicago, Ill.*): I would like to ask Mr. Goldschmidt how he divides his sales budget, if he divides it by months, and if so, is it seasonal and would you not divide it by seasonal fall-off periods? Ten per cent of the product might be sold from January to June, and the balance, ninety per cent, might be sold from July 22 to September 1. In that case, would you divide your sales budget by twelve or on a scientific basis?

MR. GOLDSCHMIDT: This would depend a good deal upon the type of business, but I do think any budget should be set up according to your own experience.

MR. SABIN: You made the remark, Mr. Grover, that you made some attempt to allocate the contributions of the Designing Department, for if they properly designed some product, they were making some contribution toward the operating profit. How would you proceed to measure that?

MR. GROVER: We measure the Designing Department, or the Development as we are pleased to call it, in exactly the same way that we would any other operation in the plant. It is not hard to segregate that development cost in our profit and loss statement so that we can tell how much of that contribution comes from the development and how much comes from the manufacturing and from the selling, but it cannot be done unless you use standards and segregate it upon your cost sheets in some way.

There are quite a number of ways to do that and they are perfectly all right so long as that principle is followed.

HENRY W. MAYNARD: How do you possibly anticipate the cost of the development of a certain project? You may plan a certain inventive process, and as the work develops, it may grow and expand. How can you possibly forecast the cost of that development work and how do you measure it? I am not quite clear on that point.

MR. GROVER: The point of determining standards on development depends a lot upon the knowledge of the Engineering Department of their own function. We base a lot of our development standards upon past performances, coupled with our knowledge of what they should be.

If we make the same kind of effort, or put forth the same amount of effort upon development that we are putting forth today upon the factory operations, I don't think there will be very much trouble in getting the proper set-up of development standards.

As for the accumulation of these future developments, we do have that condition. We do have a condition where we predetermine the development costs upon a completed line of machines or upon parts or special adaptations. We sometimes go wrong on them with the best we can do, but the only thing we can do is to check it constantly, and, when we find we are wrong, to correct it. I don't know of any plan that will absolutely predetermine development cost without a lot of past experiences as a basis.

MR. MAYNARD: Do you think it desirable to apply against development cost, if possible, the principle of issuing an appropriation? Let's take two things: that is, the research on the general invention of a certain kind of machine, and second, when that becomes fairly concrete, it is turned over to the Engineering Department to design specific machines to obtain the result. Do you ever apply, or do the directors of the company issue an appropriation of so much money to carry on a certain project?

MR. GROVER: We do that quite often, and quite often that isn't so efficient. I don't believe that when an amount of money is set aside and we have reached the end of our rope, so to speak, the management should throw out the project because they have used up the appropriation. They should continue on with it if the thing is worth while. If it is not worth while, the quicker they find it out, the better.

MR. JAMES: A lot could be said on the question of how to get into the cost of your product that hasn't yet been developed, the money being spent today on research and development work, but it is four-thirty and time to adjourn. We can't cover the subject this afternoon, I am very sorry to say, so inasmuch as we want to run this thing right on time. we will stand adjourned.

ADJOURNMENT

# SESSION III

# THE DEVELOPMENT AND USE OF PRODUCTION STANDARDS

WEDNESDAY MORNING, JUNE 17, 1931

IRVIN GEROFSKI is a native of Boston, Massachusetts, and, following his graduation from Massachusetts Institute of Technology in Engineering in 1923, he went with the Western Electric Company in Boston. He maintained this connection until 1927 when he went to the Tower Manufacturing Company as assistant production manager, engaging primarily in methods and manufacturing development. Later in that year, he entered the employ of the Aldrich Manufacturing Company of Buffalo as plant superintendent. In 1929, he entered the professional field with Scovell, Wellington & Company as industrial engineer, which position he now holds. He joined the Association during the past year.

C. W. AVERY had nine years of teaching experience following his graduation from the University of Michigan in engineering. His industrial experience covered a period of fifteen years in an important executive capacity with the Ford Motor Company as associate General Superintendent of the Highland Park Plant, and later as chief development engineer of the company, he organized many notable advancements in method and process, including the original conveying systems, the Iron Mountain lumber development, the Ford and Lincoln body factories, and the manufacture of plate glass, artificial leather and textiles. Following this experience, he went with the Murray Corporation of America as Assistant to the President in charge of manufacturing and is now the president of that corporation.

# DEVELOPMENT AND USE OF PRODUCTION METHODS

PRESIDENT COLLINS: We are ready to open this, our third technical session. For the benefit of those who were not in attendance at the opening session yesterday morning, I simply want to tell you that we are all actors playing a part in this big business drama, "Profit Making Management". You in front are the directors of the Naca Manufacturing Company. Mr. James, as president of the company, will now try to steer this ship safely through.

MR. JAMES: Good morning, gentlemen. Yesterday we had an approach to this problem that is a natural and normal approach, but it isn't the logical one. We were told by our young cost accountant and by Tom Frank and his Cincinnati associates of the Machine Tool Builders' Association, just what benefits are derived by basing cost accounts on properly established standards.

Before costs can be based on properly established standards, they must be established. However, the average executive is disposed to think that if he can just get a proper set of cost accounts, the business will carry itself along splendidly. I am sure we as cost accountants all realize that that just won't work. We can only make our cost accounts as good as the standards which are established for us by those people who know how to establish correct standards.

Today's sessions, this morning and this afternoon, will be devoted to the establishment of correct standards in the Naca Manufacturing Company by the individuals who have been taken into our new organization, and I want to say for them that they have done a good job.

Irvin Gerofski, who, until we hired him in the Naca Manufacturing Company, was a member of the firm Scovell, Wellington & Company, is a young man of sound training and broad experience. He is a man of the type that we can all listen to with the greatest

respect. He was graduated from that fine technical school, the Massachusetts Institute of Technology. He was then taken into the course of training provided by the Western Electric Company, than which there is no better. He ran through that organization for a number of years with the intensive practical training that is available there, and when he was a finished product, he was taken over by Scovell, Wellington & Company. In his associations there he has applied, in a practical way, the training that he was given, first, in one of the best schools in the country, and second, in perhaps the best practical laboratory that is available to any young engineer.

Now we have him in the Naca Manufacturing Company and he has made a study of its production problems. This morning he is going to be thoroughly practical. He is going to talk right to the point. It warms my heart to be able to introduce to you Irvin Gerofski.

## DEVELOPMENT OF STANDARDS FOR THE CONTROL OF MANUFACTURING OPERATIONS

IRVIN GEROFSKI

Scovell, Wellington and Company, Boston, Mass.

SHORTLY after your president, Mr. James, undertook the reorganization of this company's affairs, as authorized at your meeting of December 15, 1930, he invited me to assume the office of production manager in order to assist in the development of the program for the company's financial rehabilitation. It has been a distinct pleasure to cooperate with Mr. James and with the other officers in working out the reorganization problems encountered in this work, and I welcome this opportunity to outline the part which I have played in these activities.

Our cost accountant has pointed out to you the principles involved in setting standard costs and in establishing a budget. My purpose this morning is twofold: first, to explain just how manufacturing standards, which are the basis of standard costs, were determined and how they are employed to measure factory operating efficiency; and second, to describe the methods we have pursued in reducing our cost standards to the minimum.

### *Development of Standards*

In the early stages of our work we realized that we could not

develop effective standards until we had some semblance of the sales requirements as a basis for planning production and determining normal operating hours. Fortunately our sales manager was heartily in sympathy as soon as he understood what we were driving at, and, with his assistance, we have been able to proceed in a logical fashion. Based upon his sales forecasts, production

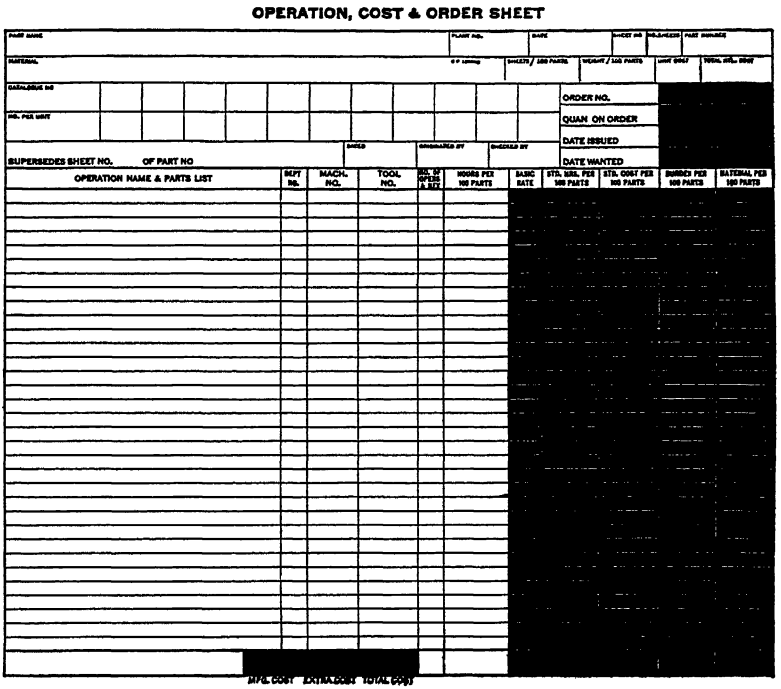


FIGURE 1

schedules were prepared for the ensuing six months. These schedules indicated in detail the necessary output by items and by sizes for each month during this period.

*Material Standards*

Our first step was to prepare detailed drawings and specifications for each nut and bolt showing dimensions and tolerances and kind of material to be used. From these drawings instruction sheets were prepared, similar to figure one, providing for the economic lot

quantity, the kind and amount of raw material, the operations in natural sequence, with machine, dies, and tools, and the standard hours required for each operation. This form was designed so that standard costs for material, labor and burden could be entered on a copy of the original instruction sheet, and with the idea that blue prints of the original could be used as manufacturing orders.

The production schedules were then analyzed by operations in order to show the production which would be required from each group of machines. The most economic lot size for manufacture was determined for each item based upon a careful study of set-up costs, possible economies in raw material purchases, the cost of carrying inventories, and possible obsolescence. Storage space was not considered because of the large amount of surplus space available.

We were then able to give the Purchasing Department a list of the raw materials needed to meet the production requirements, and the dates when such materials must be on hand. This enabled the Purchasing Deparment to plan a schedule of receipts of raw materials to meet actual production requirements, without building up heavy inventories of raw materials, and they were able to provide us with prices for calculating standard material costs.

*Labor and Burden Standards*

With these details accomplished, we turned our attention to the development of labor and burden standards. There was no justification in assuming that past experience provided any equitable measure of productive capacity for any machine; consequently, it was necessary to make methods studies of all operations. For the present, however, we have restricted the scope of our studies to the determination of best operating methods with available equipment and tools, because the financial condition of the Naca Company made it imperative to avoid studies which contemplated the purchase of new equipment or which would require heavy expenditures. At a later date, when finances permit, we hope to pursue our methods studies further, and to secure the additional advantages that will be obtainable in certain instances through the use of more modern equipment.

Our preliminary studies affected the operation of machinery and equipment. Correct operating speeds were determined, and standard practice instructions were prepared which provided all

useful operating information, which specified definite routines for inspection, lubrication, and maintenance, and which provided a uniform procedure for the storage, care, and grinding of tools. The operations were then subjected to the necessary critical analysis to determine the most satisfactory method, improvements being made through the elimination of idle time, and the correction of illogical and incorrect procedure. As far as possible, work, materials, equipment, and tools were arranged so as to necessitate a minimum of effort and time to carry out the required sequences, and to make possible the most effective utilization of time and effort without causing undue fatigue.

Provision for general auxiliary services for operators resulted in an over-all economy of labor by avoiding the occupation of skilled workers for service functions such as procurement of supplies and materials or the handling and transportation of work. Work of this nature is now being performed entirely by helpers, thereby permitting the skilled employees to devote full time to the performance of their own operations, and securing maximum productivity not only from their own efforts, but also from the equipment which they use. As each operating method was established, a time study was made and a standard set. These methods and time standards were then submitted to the foremen in the form of standard practice instructions for purposes of training and instruction of employees.

I have endeavored to show the necessity for thoroughness and accuracy in the development of our standards. Although such accuracy is highly essential for cost purposes, we realized that these same standards must also serve as a basis for any wage incentive plan which we might wish to introduce, and that no such incentive plan can be fundamentally sound unless based upon thorough and complete methods studies.

*Examples of Methods Changes*

It may be of interest to point out a few specific examples of the accomplishments and results obtained through these methods studies. One of the early jobs undertaken was a general clean-up and rearrangement of the plant. We did not attempt to lay out all the machinery and equipment in the most satisfactory way, as much of it is very heavy and would require considerable expense to move. Of necessity, we limited our activities to those which could be ac-

complished without major expenditures. We were nevertheless able to make a considerable improvement in shop conditions by specifying definite areas for manufacturing, for aisle space, and for storage space. Considerable confusion had always existed due to the fact that there had been no definite shop plan of this kind. Parts in process were stored indiscriminately in and around machines, in aisles, and, in general, anywhere that a worker found it convenient to leave them. On this account handling was difficult and costly, and in some departments mere walking from one machine to another was done at a hazard.

Most serious of all, from the viewpoint of value involved, was the condition respecting tools and dies. Since such a thing as tool control was absolutely non-existent, tools were likewise scattered all over the shop in very indiscriminate fashion. When we started to collect and classify them preparatory to storing them in tool cribs, we found many cases where several sets of tools had been made for the same parts. This was due to the fact that a particular tool or die could not always be found when it was wanted; consequently a new set was made in order to permit the manufacture of the job on hand. When they were all collected, classified, and inventoried, we were amazed at the quantity and value of tools and dies on hand. This amount was $120,000, or approximately 2½ times our normal requirements. In other words, we have an investment of about $70,000 in tools in excess of our present needs. Some of this amount is in designs which are now obsolete, and at least $20,000 will have to be written off for this reason alone. The remaining $50,000 will, at our normal rate of production, require approximately three years for liquidation. The only bright spot in this situation was the fact that we could immediately cut our labor expense for tool manufacturing from $34,000 to approximately $8,000 a year.

This reduction in expense, however cannot be wholly attributed to reduced tool manufacture which resulted from the discovery of existing surplus tools. It had always been the practice for the tool room to manufacture tools at will, without control, and without consideration of normal tool requirements. In many cases the tool maker himself was permitted to exercise his discretion in this respect. We have, of course, eliminated this practice. No tool work of any description whatever is now being performed without a preliminary estimate and proper authorization. These estimates indi-

cate a saving of between twenty-five per cent and seventy-five per cent of the time previously required to do similar work. This is partly due to the fact that only our best tool makers were retained during the re-organization of the tool room, but even more to the fact that the toolmakers now have a definite estimate to meet, and competent supervision is being exercised over the department to insure that these estimates are not exceeded.

Before leaving the subject of tools, it may be of interest for me to point out what has been done with respect to tool purchases. As you probably know, our biggest expense here is for taps. For 1930 the amount was $3,300. The usual procedure was to put new taps into use directly without any preliminary inspection. In many cases we had been receiving taps with diameters only one or two thousands of an inch in excess of the basic diameter. The result is obvious. Such taps quickly were worn down to the basic diameter and had to be discarded. More serious than this, however, was the fact that very often such taps were used when they were worn considerably below their limit. Whenever this happened the result was usually a large run of defective nuts which had to be tapped a second time. Our remedy for this situation was simple and inexpensive. All new taps are gauged when they are received and those not having a sufficient wear allowance are being returned. As a result, the life of our tools has been considerably increased, in some cases threefold.

We have purchased several gauges which are being used to make frequent tests on nuts as they come from the tapping machines. Taps can thus be discarded immediately upon being worn to their limit, and we do not now find it necessary to re-work quantities of defectives because of neglect in observing the condition of the tools.

Breakage of taps was also a common thing, and in fact one reason why so little attention had been paid to the wear allowance was because many of them used to break long before the wear limit was reached. This breakage was caused by the chilling of nuts through contact with the water cooling streams which are used to keep tools and dies at a low temperature. The installation of proper drainage systems in these machines soon remedied this difficulty.

Our research and our methods work respecting tool expense extended to other fields. Tool steel used during the year 1930

amounted to nearly $10,000. On the basis of the re-organization of the Tool Department, which I have already described to you, this expense should normally be reduced to about $4,000 for the ensuing year. This does not, however, represent our final contribution towards reduced tool expense. The proper selection of tool steels, however, involves research which requires long and painstaking study and experience. I have only one example to offer you from actual experience in the shop. It had always been the custom of the tool room to make trimmer dies (and all other dies in fact) of so-called "tool steel". The usual life of a trimmer die for a 5/8" bolt was from 100,000 to 125,000 pieces, re-dressing being required for approximately every 5,000 pieces. After making trials and experiments with several alloy steels, we produced a die which had a life of 380,000 pieces and required re-dressing only once for each 12,000 pieces.

I do not wish to mislead you into the belief that such experiments will save money in tool steels purchased. These superior steels are usually considerably more expensive than the product we have been using. In some cases there may be an ultimate saving in material costs; in other cases there may be no such saving. The great advantage, however, is in the saving in tool maintenance and repairs. This item alone will justify the continuation of our experiments along these lines.

We do not contemplate operating any of our equipment at higher speeds because of the introduction of these new tools. Much of our equipment is old and cannot withstand increased stresses and vibration. We can get the advantage of higher operating speeds only from new machines designed for such use.

I have injected this discussion and these examples of methods study at this point in order to illustrate what had to be done before reasonable cost standards could be determined. With this background I can proceed to describe the development of standards for costs.

*Cost Standards*

As rapidly as final operating methods could be established, standards of performance were set and entered on the instruction sheets. Methods studies invariably preceded the establishment of these standards, as experience has shown that independent time

studies without methods studies have no permanent value. A standard established on the basis of such a time study would become antiquated almost immediately, whether used as a basis for wage payment or for labor cost standards. This is so because once such a standard is established, the operating organization immediately undertakes to improve upon it, particularly if a wage incentive is connected with it. Since the time study in itself has not effected any improvement in methods, or eliminated any waste of time or of labor, improvement is comparatively easy, and it is not long before the standard is greatly in error. The methods study is necessary for two reasons: first, to bring the standard for costs down to a reasonably low level; and second, to insure a standard which is not only correct at the moment, but which will remain so until some fundamental change has been made in the operation.

From the foregoing you may infer that when standards are based upon thorough and complete methods studies, they have a certain permanent characteristic, and that we do our utmost in so establishing the original standard that it shall not easily be improved upon. I do not wish to convey the impression, however, that any standard should ever become an intrinsic attribute of an operation or part. We do not conceive of any standard as ultimate; rather we prefer to consider it as being in a progressive state of improvement, undergoing constant revision as rapidly as improved processes and more effective methods can be adopted.

We have then, accurate and reliable time standards for all operations in the shop. After the time standard was determined for each operation, a normal hourly earning rate for that operation was adopted as a standard. It must not be inferred, however, that all employees performing the same operations are necessarily paid the same hourly rate. Variations in day rates among various employees may exist because of the differences in their value to the company.

With these two factors established—the time standard, and the normal hourly earning rate—it was then a simple matter to determine the standard labor cost for the operation. This procedure was repeated for all operations that are performed on each part. The total of these represents the standard labor cost for the part.

With material and labor costs determined and entered on our instruction sheets, attention was centered on the development of machine hour rates for the carrying of burden charges into cost.

*Machine Hour Rates*

We divided the entire shop into operating centers, each center comprising all machines of essentially the same type. All overhead expenses were budgeted on the basis of the production schedules previously prepared. Those elements of expense which were incurred directly by the operating center were set up as a budget for that center. All other expenses were pro-rated on some equitable basis. The total operating expense, therefore, was completely distributed to the operating centers. From our production schedules we likewise determined the prospective normal operating hours for each center; and by dividing this number of hours into the total budgeted expense for the same period, we obtained a machine hour rate for that center.

These machine hour rates, together with the time standards, were then used to compute the standard burden costs for each operation. These burden costs were entered on the cost copy of the instruction sheet, thus completing the determination of the standards on which standard costs were based, and establishing the instruction sheet as a master record for cost.

The time standards which have been set as a result of a methods and time study performed on each operation have been used as a basis for a scientific wage payment plan. Our ratio of labor costs to total manufacturing costs for the past five years has averaged 25.2%, and we realized from the start that a wage incentive plan would produce few, if any, economies in any element of cost other than labor. We also discovered that wage incentives, while usually effecting labor savings, have sometimes caused increases in other expenses, for example, through increased waste of raw materials, excessive requirements for maintenance and repair of tools and equipment, and very often through disproportionate increase in clerical cost.

*Wage Incentive Plan*

We made a careful study in order to determine the form of wage payment plan which would best fit our conditions, and at the same time avoid these undesirable features. After much careful consideration had been given to the matter, including a study of experiences in several other companies, a bonus plan was put into effect based upon the standards that we have established for labor performance.

Briefly, this plan provides for the payment of a bonus which is proportionate to the excess of performance over standard. In other words, if the standard time for processing a given quantity of good pieces is five hours, and the operator produces that quantity in four and one-half hours, we will pay him at his hourly rate for five hours. In any event we pay him for the actual hours worked. Each time card for a completed operation carries the standard allowance in hours per 100 pieces; it also shows the quantity of good pieces produced and the operator's actual hours consumed. As was made clear during yesterday's discussion, these cards are scrutinized by the foremen before they come to the office so that they may know currently the operating performance of each man. The operators are expected to bring to the foreman's attention immediately any job which is causing difficulty and which is likely to exceed standard time. The foreman can then devote his personal attention to these cases and avoid losses which might be incurred in the ordinary course of events. He will give particular and constant attention to the men who habitually fail to attain standard performance.

An incentive is both desirable and necessary, as the new standards usually require a rate of production far in excess of that to which the employee had been accustomed. To be sure, the major portion of this excess productivity is due to improvement in methods and conditions, but it is likewise true that the new standard does not permit the same degree of latitude formerly enjoyed by the employees, and the bonus not only represents an additional payment for extra effort exerted, but also provides the necessary stimulus to maintain the standard rate of production. Without such stimulus, it is extremely doubtful whether any group of employees could be induced to undertake a task so much more exacting than their former one. Although the new standards are liberal with respect to allowances for fatigue and personal delays, to the average employee they seem to be severe in comparison with the lax and unstandardized conditions which formerly prevailed in the shop. Ultimately, of course, we expect that the employees will become accustomed to the new conditions, and the increased earning rate prevailing in our organization will not only assure us a well-contented and loyal group of employees, but will also enable us to select at will, for each class of work, the highest grade of labor that is available in the community.

*Summary*

In summarizing the results of our work, it is my opinion that we have already effected a permanent reduction in manufacturing costs of $60,000 a year. Through the proposed reduction in tool inventories, amounting to $50,000, there will be a further saving, in interest charges alone, amounting to $2,500 per year.

The development of standards which will enable our cost accountant to establish a complete accounting control is bound to accomplish further savings, because we men in the factory will have a definite means for measuring our own results.

At the end of each period the Cost Department is to prepare for us statements which show the relative performance of each department against standard performance. Our cost accountant has already illustrated and explained the nature of factory variances. These statements and the variances shown thereon constitute the medium through which control is exercised over manufacturing activities. The statements will indicate the relative performance of each department with respect to its predetermined standards; they will show what the deficiences are and in what element of expense they are incurred—whether the loss was due to sub-standard labor performance, excess use of materials, or expenditures for items of overhead in excess of budget allowances.

In a very real sense, therefore, we will be able to make each foreman the manager of his own department. He will be provided with a copy of his monthly statement, and he will use this as a guide in the administration of his department. His attention will be directed to every element of cost and to all phases of operations. His attention will not be restricted to labor costs to the exclusion of everything else, as is often the case when foremen and departments are rated on the basis of labor efficiency attained. He will know the importance of properly caring for equipment and tools and for operating machinery in accordance with standard practice instructions, as failure in either case will result in excessive maintenance and repair charges; he will know that he must maintain a low rate of labor turnover if he is to avoid excessive labor costs which are incidental to the training and instruction of new employees, and excessive material costs which new employees are usually responsible for because of imperfect workmanship; he will require operators to observe all safety regulations because even this kind of negligence will show up on the monthly statements in

the form of additional costs resulting from employee absence and substitution, or from unbalanced production conditions which are created; and, most important of all, he will devote his best thought and effort to the supervision and instruction of all his employees to insure the proper standards of performance, the correct method of operation, and the required standard of quality.

In exactly the same way the overall performance of the shop will be indicated by means of a variance statement which will show the total of all departmental variances, and, in addition, variances for those elements of expense which are not definitely controllable within the departments.

I cannot impress upon you gentlemen too emphatically our desire to have the general plan—as presented to you by our cost accountant, immediately approved and adopted. I have shown you what has already been accomplished through the establishment of the standards of performance; these results can be perpetuated only by introducing the proper control. Standardization and control must be co-existent; neither one can be effective alone. We already have the yardstick—let's use it.

MR. JAMES: Well, I go right back to what I said to my cost accountant last December, no wonder we can't make any money around here. But I think you will all argee with me that with a production manager like that on the job, setting the house in order and cutting out the kind of expenditures that don't produce anything either for the company or for the employees, we are going to get our costs down to the point where variations from standard will show variations from a base upon which we can make some money, even at the current prices which are available in the depressed market against which we are working at the present time.

I have a very good friend on whose advice I have leaned very heavily in this matter. He is a thoroughly practical man. He was an engineer, graduated at the University of Michigan, and after that he taught for nine years and then went into that famous Ford organization where he became an assistant foreman, a foreman, a superintendent, and finally chief development engineer.

We haven't had the pleasure before, to my own personal recollection, of hearing an outstanding man from the Ford organization talk about that particular part of it which holds the admiration of the world; that is their ability to organize their shop methods in

such fashion that they are away ahead of the precession all of the time.

He was just so good that the Murray Body Corporation took him over as manufacturing manager. For years he held that position, and now for the past three years he has been president of the Murray Corporation and he is now president and chairman of the board. That corporation, as you know, manufactures automobile bodies and the various stampings and non-rotating parts that go to make up our automobiles. I'm mighty glad to introduce to you Mr. C. W. Avery.

## MANUFACTURING ORGANIZATION AND OPERATION

C. W. Avery

President

The Murray Corporation of America, Detroit, Mich.

I WANT to say that this is the largest board of directors I have ever stood before in my life, and I thank my lucky stars that I have no appropriations to be passed upon this morning.

When I was invited to speak before this meeting, I was at a loss to understand why that honor should come to me. My entire training in cost accounting consists of a high school course in double entry bookkeeping, and why I should be selected to come down here and talk to a group of the best accountants in the world was beyond me. Then it was explained to me that cost accountants were beginning to think of something besides mere figures. If I could do anything to help that laudable ambition, I made up my mind I was for it. You see I have had some experience with cost accountants.

The greatest problem confronting industry today is sales. With this in mind, we are apt to over-stress our Sales and Advertising Departments. It is true that the product must be properly brought to the attention of the public through these divisions, but no amount of advertising or high-powered salesmanship will overcome the handicap of mediocre quality and high prices. Therefore, our real selling problem becomes a manufacturing problem—that of turning out products of the highest quality at the lowest possible cost. When this is accomplished sales effort is reduced to a min-

imum. Upon the manufacturing manager lies a large percentage of the responsibility for sales. At this point, let me state The Murray Corporation manufacturing creed: "High quality costs less than low quality because high quality and low cost are each a result of correct methods."

I shall make no attempt in this short time to make a comprehensive study of the entire subject of manufacturing, but shall discuss briefly some of its important elements.

*Plant Location*

While it may seem beside the point, a few words at this time in regard to geographical location of manufacturing plants may be pertinent. In most cases we are faced with the problem of making the best of fixed locations and properties. Sometimes, however, in extreme cases, it is advisable to discard obsolete buildings and land because of advantages offered by new locations.

Several years ago, when Michigan produced a far greater percentage of the country's lumber than it does today, a large body woodworking plant was built at Bay City by one of the then prominent body companies, which eventually became a part of The Murray Corporation. In the meantime, the center of production of body lumber had moved to the southern states. About three years ago, we made a thorough analysis of the situation. Our Bay City plant was buying most of its lumber in the south. The weight of the finished wood parts in an automobile body is about twenty-five per cent of that of the commercial lumber required to make these parts. We were shipping the maximum weight the long distance, and the minimum weight the short distance. Therefore, it seemed that the closer our plant could be located to the raw material supply the greater our freight advantage.

After a careful survey of the body lumber producing territory, we secured options on industrial land at Memphis, Tenn., and Jackson, Miss. The latter location was closer to a source of supply than the former and, had we considered this point only, we would have built our new plant at Jackson, Miss. Other features led us to decide in favor of Memphis. The last bridge across the Mississippi River is located there, which has made that city a railroad center for the areas both east and west of the river. This location more than doubled our buying range. It often happens that sawmills over produce certain kinds of lumber, which become, sooner

or later, what is known in the market as "distress lumber" and sells at low prices sometimes below cost of manufacturing. In doubling our area we doubled the possibilities of distress lumber purchasing. Memphis, having been a center of woodworking for many years, also supplied labor that was somewhat experienced in the art. In two years of operation this project has indicated its justification.

It is always advisable to give careful consideration to geographical location.

*Planning*

One of the most important divisions in manufacturing is planning. In cooperation with the Sales Department, the Engineering Department creates the product. The Engineering Department releases then pass to the engineering change group of the Planning Division, which furnishes drawings and detailed information to all interested persons. The follow-up group of the Planning Division then places requisitions with the several Manufacturing Departments, Purchasing Department and Auditing Department, according to sale schedules. Releases are timed according to the period required for each item. The Auditing Department will not allow payment for any materials shipped by vendors in excess of actual releases. Manufacturing divisions are allowed only sufficient material to produce according to releases. The Planning Division controls all situations relative to stores, receiving, shipping and schedules.

The science of proper planning, which is essential for uninterrupted progress, embraces a wide variety of duties. The Planning Division is an organization which is divided into numerous groups, each having its specific duty. The most important planning unit is the production control group. Sales requirement figures are immediately forwarded by the control group to all follow-up and shop scheduling group heads, who in turn provide all interested individuals with the necessary information. In most cases where additional schedules are expected no allowance is made for shrinkage, which is picked up in subsequent releases. When a contract is about to be terminated on any part or model an actual physical inventory is taken to determine the amount of shrinkage to avoid unnecessary overages and needless obsolescence, which is a contributing loss factor.

Through a careful scheduling system we are able to keep materials of all kinds at a minimum, which has many distinct advantages.

Low inventories increase material turnover and keep a large percentage of our assets in liquid form. Our present cash reserve is due entirely to inventory reduction realized in the last eighteen months. That, at a time of business depression such as we have been through, is very, very important. Had we not been able to reduce this inventory, we would be dickering with the banks today.

Minimum quantities of material result in reduced overhead labor for handling. Our material handling costs have been reduced by fifty per cent in the last two years, partly due to the reduction of inventory. Well-controlled stores allow any manufacturing organization to operate on a minimum of investment as far as adequate material handling equipment is concerned.

There is less shrinkage in parts, and repair costs are almost negligible.

Material, such as rubber, cloth, etc., are not given the opportunity to deteriorate as a result of being held for many months. It has been common experience in the past, when large inventories were the order of the day, to have great losses resulting from age deterioration.

Reduced inventories keep obsolescence within reasonable limits and engineering changes can be made with ease to the satisfaction of both ourselves and customers without excess cost. By permitting the customer to make changes at a minimum cost and within a short time, you automatically impress him with the idea that your company is well organized and with this comes that intangible something that we call "good will", which cannot be measured in terms of dollars.

Properly distributed inventories have a direct bearing upon insurance rates of all kinds. It is even surprising to note the reduction of accidents in plants where materials have been reduced to a minimum. High piles are hazardous.

The old fashioned foreman was a strong believer in great quantities of stock ahead of assemblies and between machine operations. Through the process of education this condition has rapidly changed in the last few years. It is now the pride of any modern superintendent or foreman to see how small a bank he can safely operate upon, rather than how large a bank he can accumulate before being stopped by his superiors.

The influence upon cost, both direct and indirect, of the reduction in the required floor space is apparent.

Poor planning has closed the doors of many companies. An automobile manufacturer, who is no longer in business, had his plant sold at a receiver's sale a few years ago. It was found upon investigation that contracts had been let for 25,000 complete sets of parts. When this company had been operating about six months, engineering changes naturally were made to improve the product. In summing up the final chapter of this company's experience, it was found that they had built approximately 18,000 automobiles in three years and had between 5,000 and 7,000 sets of parts which were worthless, to say nothing of the parts that had been affected by engineering changes during the three-year period.

Planning which is not consistent with month to month requirements puts values of inventories in jeopardy at all times. The recent continued decrease in commodity prices is in itself proof of the worth of good planning.

*Budgets*

The use of budgets, as applied to all kinds of manufacturing expense, is rapidly increasing. Budgets for productive labor, non-productive labor, and non-productive supplies and materials are just as essential as schedules of production upon which they must be based. At certain seasons the productive schedule has a tendency to increase during the month but at other seasons it has a similar tendency to decrease. These changes must be taken into consideration in establishing expense budgets. The shrewd manufacturing manager will discount his budgets corresponding to any possible decrease in schedules and will make a desperate effort to live within these budgets in the face of an increasing schedule.

*Methods Development*

The successful manufacturing concern must be alert at all times for improved methods of manufacturing. This may be done by maintaining a separate Research Department but preferably through inspiration of the entire manufacturing organization. We must anticipate trends in industry and equip accordingly.

We recently purchased equipment in the amount of $300,000 for use in the production of all-metal bodies. The all-metal body is now over thirty per cent of our total body business. We main-

tain a heavy stamping division. An installation in this division of a modern cleaning and painting system has brought us a substantial amount of business in automobile frames. This system takes a finished frame through the operations of washing, rinsing, drying, paint spraying, and baking, and delivers the frame in front of the freight car door without human effort. The increase in business made an additional expenditure necessary for a new press. This press weighs 400 tons, exerts a pressure of 2,000 tons, and is capable of doing twice the work of any other press in the plant. These improvements have increased the sales in this division forty-five per cent.

The assembly conveyor now in such common use has revolutionized assembling methods. The use of the assembly conveyor came about through evolution rather than revolution. It might be interesting to you here to give you a little personal experience:

I don't know how many of you know the history of automobile manufacture, but in the early days automobiles were assembled in a rather haphazard manner. A large single room was devoted to the Assembly Department and a complete automobile was assembled in a fixed location. Each kind of stock was distributed to each of the locations. You can imagine a large truck load of automobile rear axles coming through and stopping at each location, leaving an axle for the assembly, and passing on to the next location. That would be followed by a large truck load of front axles, then a truck load of frames, then a truck load of wheels, another truck load of motors, and so on through the complete assembly of the car until last, but not least by any means, would come the truck, through that already tremendous confusion, bearing the greatest bulk of all, the bodies.

The finished car was driven out and at that time another rear axle was left in that particular location ready for the next car. The men worked completely around the room, back to the original starting point. It was one complete routine of confusion.

About 1912 we began to talk about using some sort of a continuous method for assembly cars. Up to that time the assembly conveyor or the progressive operation conveyor had been used by the stockyards and in a very few other places. Our first attempt was a continuous line with tracks on the floor. We brought all the axles to one point at the beginning of the line. The frames were brought in at about the same point because we had to have a unit

upon which we could work and that unit consisted of the frame, front axle, and rear axle assembled. The wheels were brought in at the next point. We rolled this car, the chassis, on its own wheels on a track past the various operations and past the various stock delivery points, with each kind of stock coming to one point only.

The chasses were moved along the track by human effort. A time study of operations was made and sufficient time for each operation was allowed. The foreman would then blow a whistle and all hands stopped assembling and pushed the cars along to the next location.

It dawned upon us finally that there might be some improvements even in this most modern system, so we conceived the idea of building a mechanical pusher at the beginning of the line and putting wooden spacers between the cars, thereby moving the whole line along. That worked well for a while until the last car in the line got stuck and the pusher kept on working. The line buckled and nearly pushed one of the side walls out of the building. We then decided that further improvements were necessary. That catastrophe led to the continuous chain carrying the assembly the full length of the room, which is now in common use.

I tell you this to indicate that these things do not come about in a moment but rather through evolution.

About that time, or a little later, we had a problem of securing leather. Of course, you know most of the cars then were touring cars or roadsters. We didn't have the modern comfortable closed cars that we have today. These touring cars and roadsters required a vast amount of leather for the covering of tops and seat upholstering. To obtain the large quantities of real leather necessary, it would have been necessary to accept an inferior grade, which was not as durable as artificial leather. With this great demand, there was a tendency on the part of the manufacturers to get together and control the price, with the result that we were paying, as we say, "through the nose," for one of our principal products.

We began to investigate the artificial leather industry. I was invited to visit the plant of one of the more liberal manufacturers. I discovered that the product was made by coating cloth with some form of nitro-cellulose. It was given several thin coats, seven, I think, to be exact. A big roll containing about 300 yards of cloth was put on a reel in front of a horizontal oven which was

about sixty feet long and four or five feet high. The coating was spread continuously as the cloth entered the oven by means of a spreading knife. It passed through this oven, which dried out the solvents, and was rewound at the end of the oven. This process was repeated seven times, after which the coated cloth was put in the embossing press and the imprint of the leather made upon it.

I got to thinking about it on the way home, in this way: Seven ovens, each sixty feet long, required a tremendous amount of floor space, while all the space above the oven was a complete loss. By breaking the back of this long oven in the middle and pushing the two ends together, we would have an oven thirty feet high and sixty feet long on the floor. The leather could run from bottom to top and return as well as straight through. By the time we arrived in Detroit, we had an oven pretty well designed. We were careful to build our experimental oven in a position where we could put six more in line with it if it proved a success.

Well, after some evolution, as in the assembly conveyors, we made our oven work and it worked so well that we built six more in line with it. We put double reels at the beginning and end of this line of ovens so that we didn't have to stop our process at all, and ran these seven ovens twenty-four hours a day, six days a week.

In our trip through this plant in the East, we saw all of the machinery and equipment and were about ready to leave when we happened to mention the formula of the so-called dope that was being used on the cloth. That is when the holy hush came over the group. We were informed that the formula was almost sacred, that it was in the safe, and only two or three people in the institution had access to it. Well, all right, we had to work it out. We knew that artificial leather was coated with some form of cellulose, so we had our chemist get some cellulose and put it on cloth. We found it was very brittle. Then it must have something in it to soften it. If we put something in there to soften it, that something must not dry out immediately. It must remain to keep that leather soft during a period of time. Therefore, a non-drying oil or softener must be used. After going through all the research for non-drying oils, we finally decided upon one. But the cellulose is clear like varnish. That wouldn't do. We had to have color in our leather, black, brown, or some other color, so we had to add some pigment to the mixture. We knew that in making

paint, the pigment was ground in oil, so we ground our pigment in the non-drying oil we had found.

Then, all this mixture was so thick we couldn't operate it and we had to have a thinner for our nitrocellulose. At first we used our cellulose solvent for a thinner but the cost was prohibitive. After some experimenting we found a suitable thinner that reduced our cost to a practical basis.

After we had found a satisfactory formula, we printed it on the blackboard in great big letters and put it up on the side of the plant where everybody could read it. The president of the company where I had been refused the formula visited our plant a few weeks later. It was a great pleasure to study his facial expression when he saw our formula on a blackboard. After studying it for a short time, he said that our mixture varied from theirs only in slight details.

Invariably, the more secrecy and mystery thrown around a manufacturing activity, the less there is to disclose.

I might tell you instances like this for the rest of the morning. We had the same problem with plate glass and as a result of five years of intense research we developed the continuous method of making plate glass which is now being used in some form in all new glass factories and is replacing the old equipment throughout the world.

Scientific progress makes methods possible today that were impossible a few years ago. A well understood failure often makes later success possible and is worth much more than a misunderstood success.

About a year ago, perhaps longer than that, I talked with our tool room superintendent and tool designer about an improvement in making automobile stampings. You all know that back of the rear door in a sedan body is a sheet metal stamping that includes the rear quarter window, the housing for the wheel, and the rear corner of the body. This is the most difficult stamping we have to make. It has been experienced through a number of years that, if a stamping which has to be drawn into a double curved surface is well balanced about an axis, the result is very much more satisfactory. There is less breakage and loss.

I suggested to our tool superintendent that he draw the left seat side and the right seat side in one piece, thereby exactly balancing the stamping.

"Well," he said, "Mr. Avery, we tried that about three years ago and it didn't work."

"Why?"

"Because we had more breakage on one side than on the other and we accumulated a large number of parts that were out of balance."

"Well, that was three years ago. Has the art of drawing sheet metal progressed any in that time? Have we learned anything? Is our breakage today as great as it was then? Can we control the breakage? If it is all on one side, there must be a reason for it."

So after a few weeks of talking and pumping enthusiasm into the organization, we finally succeeded in getting them to try one model that way. Today all seat sides in our plant are being drawn double. The large double action press used in this operation is a very expensive piece of equipment. Now one is used instead of two.

*Wage Payment*

Neither high quality nor low costs can be secured by means of cheap labor. The ultimate cost of work produced by an incompetent workman is always high and the quality is invariably low. It is necessary to pay wages sufficiently high to secure a good class of labor. Our manufacturing problems must be solved, not by the payment of low wages to labor, but through the efficiency with which that labor is applied. We must consider the various wage payment plans and select the one best suited to our particular industry.

The straight day rate plan, where the workman is paid a certain sum for a certain number of hours of labor, has many advantages. This plan has worked exceedingly well under certain conditions, especially where there is a large volume of a single product.

Then, there are the various incentive plans, among which are the group bonus plan, the individual piece work plan, and the group piece work plan. While the group bonus plan has its advantageous uses, it has the disadvantage that the workman is never quite sure at the end of the day what his pay will be. I did not compare notes with your worthy manufacturing manager this morning or perhaps I wouldn't have thrown cold water on the group bonus plan, but I would suggest that he try it out in a small way before he goes too far with it. This disadvantage is not apparent in the piece work plan. This plan increases the work for the

Payroll Department and puts a premium upon individual effort rather than cooperative effort. The group piece work plan seems to be steadily gaining in favor. The individual workman is interested in group results, which inspires cooperation, the human keynote of manufacturing success.

When we installed group piece work in one department, an analysis showed a reduction of 18.7% in the direct labor cost while the average daily wage of the workmen increased nine per cent. In addition, forty-four per cent of the non-productive labor of this department was absorbed in the group. The large percentage of this latter saving was in inspection. In this plan every workman becomes an inspector. The reason is that anything not properly done by the group is brought back to that group and they must make it right before they get credit for it. Every man is interested in what every other man is doing. There was a large saving in the Time-Keeping and Payroll Departments and the total amount of manufacturing scrap was reduced forty per cent. That again, is because the workmen are interested in the final results of the group.

With these facts before us, it is needless to say that we have extended the group piece work plan to practically every division of our industry.

*Material Handling*

One of the most important items in manufacturing today is material handling. Careful attention to this element will result in tremendous labor savings as well as savings in the repair of damaged parts through careless handling. Methods should be employed that result in the least amount of confusion. Confusion is expensive and its evil effect upon the morale and spirit of the personnel of the plant is marked.

In consideration of this problem, we can do no better than to study the methods employed by nature. As we stand at the edge of a small stream, say two feet deep and four feet wide, running past us at the rate of three miles per hour, little do we realize the amount of work being done by nature, through continuous gravity flow, with so little effort. In five minutes time, this stream moves 329 tons of water a distance of nearly a quarter of a mile. Let us consider for a moment some of the methods by which this same five minutes of work has been done by man. If this water were

carried by men in three-gallon pails, this five-minute task would require 13,710 men at a cost of $548. If we employed hand push trucks, 1974 men and 987 trucks would be required at a labor cost of $82. With one-horse wagons, we would require 329 horses and 329 drivers at a cost of $54. Eighty-two motor trucks and eighty-two drivers would do this work at a cost of $4.10. With a conveyor, the necessary work for five minutes could be done at a cost of $2.56. None of these figures include cost of loading or unloading. We may deduct from this that the most efficient fuel for power used in moving materials is coal and the most inefficient, pork and beans. Wages should buy brains rather than brute strength.

In the last two and one-half years we have installed material handling conveyors to the extent of approximately $100,000. A conservative annual saving on this investment is $77,000. What banker would refuse a safe investment paying seventy-seven per cent? One of these conveyers showed an annual saving of 360% on the original investment.

There are some conditions where the flow of material is not sufficiently constant to make the installation of conveyors advisable. Under such conditions we have found the use of electric truck equipment advantageous. This equipment consists of electric lift trucks, steel skid boxes and steel flat skids. We have invested in this type of equipment $74,000, which shows an annual saving of $115,000.

Three years ago we unloaded all our sheet steel by hand at a labor cost of forty cents per ton. When we built our new stamping plant we installed cranes and brought railroad tracks into our stock room. We then prevailed upon the steel mills to ship steel in protected bundles in gondola cars. Our unloading cost was reduced from forty cents per ton to seven cents per ton, and the same cranes moved the stock from the pile to the first operation.

In our standard parts stock room, we discovered that the old method of transferring stock into bins was still being used. We installed the method of storing stock in original containers and reduced the force of men from twenty-eight to four, an approximate annual saving of $28,000.

With this experience, it is needless to repeat that correct material handling is one of the very most important features of successful manufacturing.

*Factory Layout*

Closely allied with material handling is factory layout. In a correctly laid-out factory, a large percentage of material handling is eliminated, which is far better than the use of the most efficient methods of handling.

When we built our new stamping plant, we were criticized for having our machines so close together. Our only regret today, however, is that many of our machines are not closer together. In a line of presses properly placed, where material is flowing through in successive operations, the feeder of one press can remove the work from the preceding machine, thereby saving one man at each press.

When walking through the old plant a few months ago, I discovered one press operator walking 167 steps for every three pieces he produced. It is needless to say that this condition was corrected immediately.

In building the woodworking plant at Memphis, careful attention was given to layout, providing for a continuous flow of material with the least amount of handling. We made this plant completely modern, even to the extent of discarding a large quantity of obsolete machinery. There are no lumber piles in the yard. Our lumber arrives on one side of the plant in freight cars, is piled immediately upon kiln trucks, and starts the progressive movement through kilns, rough mill, finish mill, and is finally loaded into freight cars in the Shipping Department on the other side of the plant. Our shavings and waste make steam in our own boilers at 250 pounds pressure, which is passed through turbines, generating our own power. This steam exhausts from the turbines at fifteen pounds pressure and is passed through the coils in our kilns which dry all our lumber, and the hot water condensate is returned to the boilers with some of its original heat units still intact.

Correct factory layout reduces material handling to a minimum, whether the saving is reflected in direct or indirect labor.

*Human Relationships*

The most important and most interesting feature of manufacturing is control of the human element. We have mentioned the importance of cooperation among the workmen. Cooperation on the part of the executive staff is even more important. This

is to be secured only through the medium of high calibre leadership on the part of managers, superintendents, and foremen. A cheap executive is often more expensive than cheap labor. No football game was ever won through individual effort but rather through cooperative team work. Disagreements and jealousy have no place in a manufacturing organization and usually indicate too little to do by too many men.

Men who have reached the limit of their capacity are a real problem. They must be watched to prevent settling back. By some chance, it has occurred that such men have been promoted to responsibilities that are too great for them. This is unfortunate, but in the long run it is a distinct advantage to these men to remove them from the organization. Demotion in an organization is bad for the individual and the organization. If a man is retained in a position for which he is not suited he will build up living standards commensurate with the salary paid by such a position. Such a condition is impossible and cannot last indefinitely. It is a distinct advantage to such a man to remove him from the organization and let him seek his level in new fields of endeavor. We must be constantly training young men to replace those who are not sufficiently flexible to adapt themselves to ever-changing conditions. There is no product of manufacturing, however fine, that can give the satisfaction that the properly trained human product can give.

An illustration of this fact happened in one of the suburbs of Pittsburgh. During the shortage of plate glass several years ago, before our new system was ready to operate, the automobile company with which I was then connected thought it necessary to buy a plate glass factory to meet its demands. We bought a plant with an excellent organization and very modern improvements as far as the old pot and table method was concerned. As you know, in that method, the mixture is put into large clay pots and these pots are put into the furnaces. Then the whole thing, mixture, pot and all, is brought up to a temperature of about 2,600° and the batch is melted. Following the melting stage is the critical period in making glass. It has to be watched very carefully, the temperature allowed to reduce slowly and just at the right speed, and the man who watches that is called a glass finisher.

We discovered that the production was decreasing and the cost was going up rather rapidly. So, I went down to the plant

and discussed the trouble with different members of the organization. We finally discovered that the reason for our high cost and our low production was the poor, unuseable glass that was being produced by our glass finishers. It seems that we had had two or three very excellent finishers, the best in the country, but through some changes we had acquired a group of men who were very inefficient.

I asked the manager to let me handle the situation for a while and told him I would not hold him responsible for production or costs in the meantime. I asked him if he had a good glass finisher. He said he had—one of the best in the world. So, I asked him to have the man come in.

This man came in. I have the greatest respect for men who have worked through years and years on any activity and made a success of it. This man was about sixty years of age, very substantial, and a man who was proud of his accomplishment.
ment.

I said, "You claim to be a good glass finisher!"

He said, "Yes, I do."

"You are proud of your product when it goes out?"

"Yes," he said, "exceedingly proud of it. If I can make a good product I am always proud of it. It worries me when I don't."

"Your glass, when it is finished, is at its best. It never is as good again as it is the day it is finished. It is either broken, scratched, or dulled by the elements."

He said, "Yes."

I asked, "How would you like to turn out a product of which you could be just as proud and have that product get better with age?"

Well, that impressed him as being something very desirable if it were possible.

I said, "If you would like to do that, from now on your product is going to be glass finishers. I don't care whether you finish one foot of glass or not, your job from now on is to make good glass finishers. I will give you the opportunity of going through this organization and picking out any young men that you think are bright enough and have ambition enough to become good glass finishers. You may handle one, two, three, four, or any number you can at one time and do them justice. If you get any good

glass as a by-product of this procedure, fine; if not, don't worry about it."

In a month's time the plant was producing more and better glass than it ever had before, and at the lowest cost. Our Glass Finishing Department was filled up with a group of bright young fellows who had grown up in the organization.

*Conclusion*

There are many phases of the manufacturing problem which can be discussed. Here we have entered briefly into some of the most important. While geographical location cannot always be considered it sometimes has a very definite influence on cost. It is necessary, through careful planning, to provide sufficient material for daily needs, and no more. Expense budgets are as important as productive schedules. Manufacturing methods must be kept up to date through scientific research. Wages, consistent with high-grade workmanship, must be distributed through a suitable plan, determined by a careful study of the particular industry in question. Material handling and factory layout together have a very important relationship to successful manufacturing. The organization is by far the greatest factor. A group of high calibre men, working, with cooperation and determinaion, is invincible.

MR. JAMES: Mr. Avery, on behalf of the board of directors, I wish to express to you our profound appreciation of the sacrifice of time and effort you have made and the distance you have come to deliver this outstanding paper from the wealth of your own personal experience. It has shown us how to do just those things that Mr. Gerofski meant when he said it wasn't so much a matter of making time studies as of making methods studies; not figuring how long it takes to do the thing the way we are doing it now, but figuring out the best way to do it and then determining how long it should take. I think you have made an outstanding contribution to the annals of the National Association of Cost Accountants, and we thank you.

Both Mr. Gerofski and Mr. Avery will be very glad to answer any questions on this very practical problem of effective administration of manufacturing operations.

J. E. SIMMONS (*Chief Cost Accountant, Arrow-Hart & Heglman Electric Company, Hartford, Conn.*): I would like to ask Mr. Gerofski if he intends to apply the wage incentive plan to the tool room.

MR. GEROFSKI: I have tried to make clear the fact that the incentive plan itself is not of prime importance. We are not doing this merely for the sake of getting a wage incentive plan. We must keep in mind our fundamental purpose, which is cost reduction. An incentive plan is only a means to this end.

Our procedure, then, is as follows. We first make the necessary methods study. We get the tool organization to function in the most effective and most economical manner, and if we accomplish our purpose by so doing, we will stop there. The same thing is true of a production operation. If we can get a method established that will effect what we believe to be the ultimate in cost reduction, we will stop right here. We don't necessarily set a standard for wage incentive purposes for every methods study which we establish. We get the method first and if we can save any more by means of a wage incentive, we shall do so. Very often wage incentives will not contribute anything of material value. If not, we will not establish them.

THOMAS J. BURKE: Mr. Gerofski, in setting the machine hour rates for the department and distributing the overhead expense, do you do so on a basis of what the machines can run during a certain period or what you expect they will run according to the production you are going to make?

MR. GEROFSKI: The cost rates are established on the basis of machine capacity or upon normal production. I think I mentioned that we established normal operating hours for each machine center.

MR. BURKE: I mean, on what basis have you established those?

MR. GEROFSKI: They were established on the basis of the production, which in turn is based on sales expectancy.

MR. BURKE: Where your sales are expected to be fifty per cent of capacity, would you have a double overhead rate?

MR. GEROFSKI: If such sales expectancy were taken over a long period of time, that would be true; but if it is taken over a seasonal or shorter period, we would still use overhead rates based on normal volume.

As I have already explained, we base our normal operating hours for each machine group upon the production schedules and those production schedules, you will recall, are based upon the sales forecasts. Those forecasts are taken over a rather long period of time. They are not seasonal in their aspects. Consequently, if our sales forecast for a particular machine group indicates a utilization of only fifty per cent of capacity, we will establish the rate on that basis.

MR. BURKE: If you have a competitor that doesn't do that, you stand in a pretty poor position, don't you? Is that a general practice?

MR. GEROFSKI: I don't know that there is a general recognition of any particular practice. The policy adopted may be influenced by the necessity for meeting competition.

R. E. JACKE (*Cost Accountant, Reynolds Metals Company, Louisville, Ky.*): To what extent do you recommend condition changes in anticipation of the setting of standards, and will not a group incentive allowing the employees a portion of the savings effected, accomplish the same purpose?

MR. GEROFSKI: As I understand the question, you ask whether the group incentive will not accomplish the same purposes we have contemplated with any incentive, say an individual incentive. Is that right?

MR. JACKE: As it affects condition changes in itself.

MR. GEROFSKI: Just what do you mean by condition changes?

MR. JACKE: For instance, a preliminary survey in making mechanical changes and the costly moving of machinery which will effect more economical manufacturing.

MR. GEROFSKI: I don't believe the group incentive has anything to do with that. As a matter of fact, in many cases when we are establishing a method and setting a standard, we don't know at the time whether we will use the group or individual incentive plan. It makes no difference. We establish the best method possible; we decide afterwards whether the group or the individual form of wage incentive is more adaptable to the particular operation.

MR. JAMES: Is that the question? Were you concerned with the difference between group and individual incentives, or did you have in mind the question of whether or not, if you provide the necessary incentive to the workmen, they will bring about the improvements in methods that Mr. Gerofski has said are the responsibility of the management?

Mr. Gerofski's point, as I understand it, is that the management has the responsibility of determining correct methods. In other words, the management must set its own house in order and leave it to the workman to work with the tools the management gives him.

MR. GEROFSKI: I don't believe that the workers themselves, regardless of the form of incentive that is provided, can establish the best methods. In the first place, they very often don't have complete knowledge of an operation and its requirements and more particularly, they don't have the wherewithal with which to establish a method. They cannot, for example, make the necessary improvements in tools, in equipment, and in operating conditions. They can have very little influence along those lines. It is not only the management's responsibility to establish the methods, but it is necessary for the management to do so.

A. W. BASS: I did an unusual thing recently; I made a visit to the plant and took a little trip through the shop. I came away with some impressions. I was glad to hear our new production manager outline this morning such a plan as could be used in the way of setting a standard for direct labor, because I was considerably impressed with the overhead in that shop which, as I saw it, amounted to a great deal more than the direct labor.

Mr. Gerofski has spoken of some studies of tool expenses, but I am wondering what plans he has in mind for setting standards for the supervision in that shop, the material handling, the time-keeping, the manufacturing supplies, and other things.

MR. GEROFSKI: I believe I have already made reference to these matters. You will recall that the ratio of our labor expense to the total manufacturing expense was only twenty-five per cent, and that consequently we couldn't expect to accomplish the entire job through concentration on labor cost alone. Naturally, the other seventy-five per cent must receive due attention. Satisfactory results can not be attained through study of labor costs alone. All phases of manufacturing activity must be subjected to a similar scrutiny.

HENRY W. MAYNARD: I understand that the Naca Manufacturing Company, when they came to set the wage rates as a basis for the standards, found a great many miscellaneous rates which they simplified and reduced to figures in multiples of three: sixty, sixty-six and seventy-two cents for the men; thirty, thirty-three and thirty-six cents for the women operators. I understand that there were something like fifteen different rates between fifty-six and sixty-six, through an additional cent here, two cents here, ten per cent increase or ten per cent reduction, and they simplified those and simplified the job classifications and made the bookkeeping easier.

Yesterday Mr. Reitell said that he did not include in the departmental budgets the allocated expenses. I understand that Mr. Gerofski does include in the machine hour rates the allocated expenses of departments. Is there a hiatus there between the budget and the cost accounting work? It seems to me the fundamental work, the budget work, and the cost accounting should be identical as far as possible. Are the two things handled by the same clerks or by different people? There is a possibility of accounting difficulty there that I would like to have ironed out.

MR. GEROFSKI: I don't believe, Mr. Maynard, that there is necessarily an inconsistency between those two ideas. We establish our budget, as Mr. Reitell pointed out yesterday, on such a basis as will permit the definite allocation of responsibility. In

other words, departmental budgets include only those items for which the foremen themselves are responsible. Nevertheless, it is clear that we must get all of the expense into the cost of the product, and in setting the machine hour rates, we must make an allocation of those expenses for which the foreman is not responsible, in order to include them within the cost of the product.

MR. MAYNARD: Then is the volume variance, which Mr. Reitell spoke of yesterday, the same thing as would appear on your books of accounts, using your machine hour rates?

MR. GEROFSKI: If we consider the shop as a whole, that would be true. I have described how we combine the sum of the departmental variances, with the variances for those elements of expense which are not definitely controllable by department heads, in order to produce an overall factory variance. This total variance embraces all elements of expense within the factory. On the other hand, the departmental variances pertain only to those expenses which are of interest to the department head. They have no direct relation to the books of account.

MR. JAMES: Perhaps, Mr. Maynard, I could suggest an accounting procedure that will clear up in your mind the difficulty that is troubling you. Mr. Reitell very appropriately said that in making budget statements each responsible man is charged only with the expenditures over which he has definite control, but for cost purposes, perhaps, we will say that his own particular budget sheet has on it that part of the general prerated expense that is assigned to his department. That amount would be in his budget column at a pre-determined figure, and the precise figure would be in the actual column.

That is all that is charged to him and there can be no variance drawn on that item because he is not responsible for that variance. That variance is washed out before it comes to him on the budgets of those who are responsible for those general prorated items. Therefore, as a matter of mechanics, you can get right into your departmental sheet all of the machine hour costs without having any variances superimposed upon any of those direct departments.

Do you see the mechanics of it?

MR. MAYNARD: I see the mechanics of it, and granting that it is desirable to give to the foreman just what is appropriate for him, the thing I want to bring out is that the budget work and the accounting should be linked together so that if they do differ they differ along precisely the plan worked out.

MR. JAMES: Well, that accomplishes it. For example, in the Punch Press Department the foreman gets his budget in detail, item by item, and against that is charged, item by item, the actual expenditure and the difference between the two is the variance. But he will have one figure at the bottom of that budget column, perhaps $1,000, the details of which he knows nothing and with which he is not concerned because, in his actual column, he was actually charged with that $1,000, which represents that amount which is assignable to his machine hour costs without any control on his part.

The variances there are taken in the budgets that are over his head and washed into the variance account in your profit and loss statement.

MR. MAYNARD: I have known so many cases in which, in one company, there are different figures floating around from different sources which are supposed to mean the same thing, and that condition always causes trouble. That is why I believe in one source of figures, and one figure that means one thing.

MR. JAMES: I believe this will accomplish it, Mr. Maynard.

LYLE H. OLSON (*Vice-President, The American Appraisal Company, New York City*): Mr. President, I am here representing a stockholder, a stockholder who is particularly property minded, and is familiar with the development of this plant property throughout the past years. This stockholder tells me that about thirty per cent of the investment was made in the prewar years and this was largely written off. It was increased during the war period when they expensed a great many of their betterments, and further additions were made during the 1919 and 1920 high cost period.

This stockholder appreciates, as shown by the balance sheet, that the plant represents about seventy-five per cent of the total

assets of the Naca Company. He appreciates the tendency toward obsolescence in this plant and the trends that confront us tending to accelerate this condition. Mr. Gerofski referred to the amount of excess storage space, the excess of tool equipment, and that the machinery is not designed to meet the requirements of high speed tool steel. I understand that the forge shop equipment is obsolete and should be replaced in part and that the plant is not as completely electrified as it should be. Therefore, in establishing standards, consideration should be given to the fact that we have a plant investment of over a million dollars made under conditions that indicate that a depreciation reserve of only about eighteen per cent of this investment is inadequate.

We also have patent values in our asset accounts, which, while they have been depreciated to $29,000, are, I understand, no longer of value on account of the changes made in our product.

I am, therefore, not satisfied from a consideration of our present position, and the information presented to us yesterday, that the budgets reflecting the economies established are on a basis to permit us to write off the remaining value of the plant assets of $859,000 and the patent value of $29,000 over the remaining expectancy of useful life of the property units.

Your plant superintendent has shown a keen insight into the property problems, and I would like to leave this thought for his consideration: whether the estimate adequately provides for the allocation of the $859,357 net plant (or $1,048,754 of plant investment) to the various production centers, and the recovery of these in operating costs over the remaining useful life of the property. This may be complicated by the fact that the plant accounts, in part, may not correctly reflect the investment made, or its allocation to the units serving the respective production centers.

I will, therefore, report back to this stockholder that a very constructive program has been outlined which seems to insure the success of the Naca Manufacturing Company, but that I am not convinced that provision has been made to adequately provide for the recovery of seventy-five per cent of the capital represented by the fixed assets over their remaining estimated useful life.

MR. JAMES: Mr. Gerofski, you have heard the gentleman's comments. Have you any comments?

MR. GEROFSKI: There is one comment I should like to make. There is an inference in Mr. Olson's remarks that the plant assets as shown do not represent the true value. If that inference was intended, I must disagree, because I believe that the plant assets as shown are sound and conservative. I don't believe therefore, that the question respecting the allocation of excessive plant valuations over and above true values, is entirely germane.

MR. BURKE: On what basis do you intimate this?

MR. JAMES: The American Appraisal Company, and I see one of their representatives here, who will probably bear out Mr. Gerofski's statement.

MR. BURKE: I understand bankers today are judging values on returns. Your return certainly doesn't justify your statement that you have sound values in your assets. It is not a question of what is tied up in assets, it is what returns you get. Judging from your experience over the past five years, I would say very distinctly your fixed assets are not justified.

MR. JAMES: But the purpose of this whole thing is to reorganize the company so as to justify them by the profits.

MR. OLSON: I did not intend to raise the question of value. I wish to correct this inference that may have been taken from my remarks. That is a separate problem. But, we have a stated investment of over $1,000,000. Considering the facts that have been given to me with reference to the property, I challenge the correctness of the statement and the adequacy of the reserve that has been established against this investment—but more particularly I inquire as to the method of allocating the questionable investment to the production centers and the recovery of this investment through operating costs over the remaining expectancy of life of the respective property units.

MR. GEROFSKI: I think Mr. Reitell touched upon that yesterday in his outline of the method of allocating all costs to particular production centers. It is necessary, of course, to take into account fixed expenses on the basis of the value shown. In other words, depreciation, interest on investment, taxes, and other

charges that are incurred in connection with this investment, are applied to the production center in the same way that any expense is applied.

MR. JAMES: And I may add to that, our depreciation is rather liberal: three per cent on the brick building and 7.5 per cent on machinery, and as Mr. Gerofski said, it is pretty good machinery.

J. E. SIMMONS: I would like to ask Mr. Gerofski another question in connection with the tool expense. Like Mr. Bass, I took a trip through the plant, and I spent quite a little time in the tool room and also talked to the factory superintendent.

I noticed particularly that, in view of our low production at this time, we had excess tool facilities as well as excess cost of maintenance. As you have shown by your initial survey of the tool facilities, we have excess facilities in that regard.

Would it not be better in view of the position of our company at this time and the drive that we should make to cut down expenses immediately in order to make a profit this year if we can, to perhaps take a leaf out of the book of our old time management and preliminary to your more careful survey of the tool situation, which will obviously take a long period of time, actually reduce our tool expense by letting out a few of our tool makers?

MR. GEROFSKI: I am sorry if I didn't make that particular point altogether clear. We have already done that. I described how we have reduced our present expense for tool production from $34,000 a year to $8,000. That has already been accomplished and no further survey of the Tool Department will be necessary.

MR. SIMMONS: May I ask, was that accomplished through a reduction of repairs and renewals of the present tools we have on hand?

MR. GEROFSKI: That was accomplished through the complete reorganization of the Tool Department.

PRESIDENT JAMES: It is twelve o'clock and we must eat.

Adjournment

# SESSION IV

# DEVELOPMENT AND USE OF DISTRIBUTION STANDARDS

WEDNESDAY AFTERNOON, JUNE 17, 1931

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R. H. DICK, *President,*

Barrington Associates, New York City

R. H. DICK is a graduate of Ohio State University in engineering and was for many years connected with the Safe Cabinet Company first as superintendent and afterwards as president and general manager. For the past several years, he has been in professional work specializing in sales analysis and planning. He is now head of the Barrington Associates of New York City, a concern that devotes itself entirely to market analysis and complete study of sales problems for individual industrial companies.

GEORGE V. CHRISTIE, JR., was originally a reporter on the Brooklyn Eagle but entered the industrial field as advertising manager of the Charles Williams Stores. He later became assistant manager and sales manager of the Johns-Manville Corporation, and for the past few years he has been general sales manager of the Gifford-Wood Co. of Hudson, New York, manufacturers of conveying and hoisting equipment.

R. H. KNOWLAND was graduated from the Massachusetts Institute of Technology in 1916. After that he was with the Lewis-Grant, MacDonald organiation as a consultant chemical engineer. In 1922 he established his own business in consulting chemical engineering in Boston devoting most of his time to the textile and paper industries. His work in this field lead to a connection in 1929 with the Bigelow Sanford Carpet Company, of which organization he is now vice president and general manager.

# DEVELOPMENT AND USE OF DISTRIBUTION STANDARDS

PRESIDENT COLLINS: Fellow directors of the Naca Manufacturing Company: We are now ready to resume the fourth session in trying to solve our problem. President James will again open the meeting.

MR. JAMES: This morning I told you we were proceeding in a natural way but we were not taking up this matter in logical sequence. When we lay out a cost system we find we have to have standards and we think first of production standards. This morning we heard a good deal about how to set production standards but we can't have any production at all until we find out what we are going to produce. The only man that can tell us what we are going to produce is the salesman. He should logically be the first man to consult instead of the last, but as those things usually develop in this world, he is the last man who gets in. But he is the most important man. The whole arch is held by the key stone that is the Distribution Department.

It has been most gratifying that we have been able to induce the outstanding authorities in this country to come here and join the organization of the Naca Manufacturing Company.

Our new sales manager, who is going to lead the discussion this afternoon, is a man who, while he was a graduate of Ohio State University in engineering and was superintendent and afterwards president and general manager of the Safe Cabinet Company for twenty years, was all his life heading more and more in the direction of specializing on sales and, until we got him, he was the head of Barrington Associates in New York, a concern that devotes itself entirely to market analysis and the establishing of the potential sales in every industry in which it is called into consultation.

Therefore, it gives me a great deal of pleasure and I am proud of the opportunity to introduce to you Mr. R. H. Dick, who would be the president of Barrington Associates of New York, if he were

not the sales manager of the Naca Manufacturing Company, and who will tell us how much it is possible for us to sell so that we can apply these standards of ours in a definite fashion.

## REORGANIZATION OF THE DISTRIBUTION DEPARTMENT

R. H. Dick

President

Barrington Associates, New York City

IT is gratifying to have the privilege of appearing before the board of directors. It gives the opportunity, which I have long desired, of providing the board members with a more intimate picture of our distribution problems, and of the plans we have formulated to cope with these problems.

As you know, I have but recently joined forces with the Naca Company. Until a few months ago I had no knowledge of this company's affairs. Furthermore, I came from an industry which is but indirectly connected with the nut and bolt trade (which I understand was one of the reasons why I was chosen for the position of sales manager of your company). It is therefore fair to assume that I have been able to bring an outside viewpoint to bear upon your sales problems, and I believe this has been helpful in properly evaluating some of the practices which I found to exist in this industry and in this company.

With the aid of Mr. Reitell, our cost accountant, and Mr. Warren, our controller, it has been possible to make a thorough analysis of the sales history of the Naca Company, and also to get a rather clear picture of the market and industry situation into which Naca operations must be oriented. I will now endeavor to set forth, as briefly as possible, our findings and plans.

*Industry and Company High-Lights*

In order to supply the necessary background let me first set forth a few of the salient facts concerning the company, the industry, and the company's markets.

As you of course know, the Naca Company is a manufacturer of nuts, bolts and rivets. Inasmuch as rivets and miscellaneous products represent but ten per cent of the company's output, our

company can properly be considered essentially a nut and bolt manufacturer. It is interesting to note that for the country as a whole, eighty per cent of the annual output of the nut, bolt and rivet industry consists of nuts and bolts.

U. S. Bureau of Census figures for 1929 show that the total output of this industry for that year had a monetary value of $126,000,000 of which the Naca Company's output represented about one per cent. This production was achieved in a total of 212 establishments, of which 118 were engaged primarily in the manufacture of this class of products. However, fifty-five manufacturers are responsible for the bulk of the production. Of these, twenty-one (or thirty-seven per cent) are located in Ohio and Pennsylvania. The remainder are located as follows—

| | |
|---|---|
| New England | 6 |
| New York, New Jersey and Maryland | 7 |
| Michigan, Indiana and Illinois | 8 |
| Alabama | 2 |
| Missouri | 2 |
| West Coast | 5 |
| Scattered | 4 |

In recent years there have been four important mergers in this industry, three of which were successful. Most of the concerns making nuts and bolts operate in but one plant each, but a few of the leading concerns have several plants located at advantageous points. Owing to the high cost of transporting this class of products the area in which any one producing unit can profitably operate is restricted. The Naca Company's natural area lies within a radius of 300 miles of Pittsburgh, though under certain conditions to which I will later refer, the company can operate in a limited way in a much wider area.

For several years prior to the war, Naca's volume averaged about $200,000 per year. During the war its volume multiplied, but by 1921 it had dropped back to pre-war levels. Beginning with 1922, however, the volume started to climb steadily, until it finally reached $1,250,000 in 1929. In 1930 sales dropped back to $961,000 and it is estimated that sales for the current calendar year will not exceed $800,000.

The company sells its products through four full-time salesmen and fourteen agents or part-time salesmen. Its customers consist of

jobbers, of the hardware and mill supply type, and of industrials who are sold direct. In 1929 some eighty-nine per cent of the output went to industrials (which include railroads and utilities) and but eleven per cent to jobbers. In that same year twenty-three per cent of the country's total nut and bolt business was done through jobbers. To date Naca has been, essentially, an industrial rather than a jobber supplier. Jobbers, generally, are not able to sell the railroads, utilities and larger industrials.

The company's products are of good quality, and the inspection system is effectual. The line is broad and complete. The prices are in line with those of the industry, the company neither endeavoring to command a premium nor particularly taking the lead in the price-cutting which has been so prevalent in recent months. It would be straying from the truth however if I tried to convey the impression that the company has not, at times, stressed price rather more than quality in its selling practices; probably the most accurate way to state the matter would be to say that the Naca Company has been prone to meet *very low* prices a little too promptly.

One further important fact should be borne in mind in viewing the situation, namely, the fact that Naca is not a so-called "tonnage" house. Reciprocal buying (especially where railroads are concerned), and the inadequate caliber of the selling personnel, have operated to greatly restrict the company's chances of getting much worth-while tonnage business. As a result Naca is, to a certain extent, a job shop, making many special types of nuts and bolts with which a tonnage house ordinarily does not care to bother.

*Type of Approach to the Budget*

In my approach to the task which confronted the Sales Department it was of course necessary first to ascertain the sort of facts I have just recited. The next steps were to learn, in detail, what the company had been doing, exactly what the management wanted to do, and how much it could afford to spend to get it done. Guided always by the dominating thought that *net profit,* and not *sales volume,* was the company's major objective, we proceeded to study the various types of sales budgeting, administration and control methods that were in successful use by other concerns, and to determine how they could be adapted to the Naca Company's needs. It was our firm belief that we must substitute knowledge for guess-

work if we were to make a sound approach to our sales problems, and that we must and would work toward a planned future. The plan which resulted is, of course, not ideal, but we believe it to be practical.

*Sales and Expense Budget*

The bases of the plan are represented by a sales volume budget and a sales expense budget. Bespeaking your patience, we would like to indicate a little of the procedure followed in developing each of these.

In making a sales forecast it is necessary to develop data concerning both past sales performance and potentials, and then give consideration to these data in the light of contemplated changes in products, prices, and selling policies, and in the light of business conditions and miscellaneous fortuitous factors.

We first made a complete break-down of sales performance for several years past, re-organizing the figures to show sales by each territory, by classes of customers and by size of accounts within each territory, and in all cases carrying the figures through on the basis of items and sizes of products. All of the foregoing was developed on a monthly basis to show the seasonal history, inasmuch as this information is very important for production planning purposes.

We then proceeded to establish potentials in each of the same areas on the basis of the following factors—

| Weight % | |
|---|---|
| 70 | (1) 2,798 leading accounts (1,661 industrials and 1,137 jobbers) |
| 10 | (2) Total number of hardware jobbers. |
| 10 | (3) Total number of mill supply jobbers. |
| 10 | (4) Total number of manufacturers of all kinds, rated $35,000 and up. |
| 100 | |

After these data had been developed we made a study of all the territories in the light of both past performance and potentials, and considered certain other important factors which it will be well to mention at this point.

As before stated, Naca's natural operating area lies within a 300-mile radius around Pittsburgh. However, that considerable

business has been secured elsewhere is evidenced by the fact that in 1930 only seventy-one per cent of the total volume was secured in this area. New England, the southeastern and the west coast states contributed the remainder. It is interesting to note that while Naca gets seventy-one per cent of its business in the natural Naca area this territory contains but forty-seven per cent of the better potential accounts.

History proves that Naca can operate outside of the natural area but such business cannot be cultivated aggressively owing to the small margin of profit available on such business. Consideration was given to abandoning the outside business entirely but a careful study convinced us that this additional volume played such an important part in reducing unabsorbed factory burden that we could not afford to sacrifice it. It was agreed that we would continue to use only part-time representatives in these outlying areas who, because they work on a commission basis, represent no investment on the part of the company. We plan to keep all outside areas under constant surveillance and, with the aid of the cost accountant and the controller, limits have been established which determine at what points territories become unprofitable due to the price concessions made in deference to freight cost equalizations.

In the light of the data pertaining to past performance, potentials, distance from Pittsburgh, natural local trading area boundaries and similar factors, we re-arranged all territories whether for direct salesmen or for the part-time agents. We also took into consideration that we intend, in three territories within the 300-mile radius, to replace agents with direct salesmen. We are satisfied that all territories are now so laid out that they are of workable size; that they are well adapted to the character of selling activity we intend to apply; and that the cost of operating them is commensurate with the potentialities and the other factors that were given consideration.

The next step after the establishment of the new territorial lines called for the assignment of sales quotas to each territory. This involved taking into consideration the following points:

(1) What changes were to be made in the product lines within the next year?
(2) What changes were likely to occur in the prices?

(3) The likely effect of the new sales policies and sales administration in quickening sales effort and making it more effectual.
(4) The effect of the new advertising campaign.
(5) Trend of the industry's total volume.
(6) Likely trend in general business conditions.
(7) Special competitive strength in certain territories.
(8) The substitution, in three territories, of direct salesmen for part-time agents.

The final quotas established were, however, based upon giving weight to the following factors:

| *Weight %* | |
|---|---|
| 45 | Past sales performance (four year average) |
| 20 | Potentials |
| 10 | Business conditions |
| 25 | New sales program and policies |
| 100 | |

These percentage weights will apply only for 1931 and 1932. In 1933 we will likely give more weight to both potentials and past performance, and correspondingly less to the factor of new policies.

The next step in the process involved recapitulating and drawing together all of the quotas into a general company budget for both sales and factory operating purposes and the establishment of control records to show actual performance against the detailed budget.

Briefly, the steps we took in evolving the budget were—

(1) Making the market analysis by analyzing past performance and calculating the potentials.
(2) Laying out the territories.
(3) Setting the quotas for each territory.
(4) Establishing the total company budget.
(5) Setting up control records for the administration of the budget.

We next set up the sales expense budget. We approached this matter by analyzing sales expenditures for the past five years, by object of each expenditure made, and by function. This was done for the company as a whole, and in the case of field sales expenses it was carried out by the territory. In all cases it was reduced to monthly terms. The many changes in the sales policy that were and are in process during the current year, however, compelled us to modify greatly the past performance figures for the purpose of setting up the new budget. To the best of our ability we endeavored to handle this matter conservatively, and we are quite certain we can function within the budget figures. Furthermore, provision has been made to reduce the budget in a pre-determined ratio in relation to any possible failure to achieve the sales volume budget. The total of the expense budget for the present year is $90,000 but this can be cut, if necessary, to the extent of fifteen per cent per month upon thirty days notice. The budget was worked out by object of expenditure and by function, and was translated in terms of months. The process was completed by the establishment of records by which performance against budget could be measured.

*Channels of Distribution*

It is not possible, in the limited time at our disposal, to do other than indicate the principles used in developing our budgets. Further details would only weary you, and this is neither the time nor the place to go into them. I simply wanted the board of directors to be familiar with the principles which were employed in dealing with this important phase of our plan.

There are several other matters I desire to place before you, the first of which is the question of channels of distribution. We stated to you a little while ago that the Naca Company sells in two ways, namely, through jobbers and direct to users, and that in 1930 the company's business was divided between these two groups as follows:

| | |
|---|---|
| Jobbers | 11% |
| Industrial | 89% |

The average size of the jobber account was $1,210 and of the industrial account $4,210. In that same year there were ninety-five active jobber accounts and 224 active industrial accounts.

Naca has done a better job, proportionately, in selling to the

industrials than it has in selling to the jobbers. This is shown by the fact that in 1930 it sold only 8.3 per cent of the country's total number of desirable jobbers but sold 13.4 per cent of the desirable industrial accounts. Naca has not had its proper share of the jobber business, and I would like to say just a word about jobber distribution.

I happen to know of an instance that occurred with one of our country's largest institutions who, eleven years ago, decided they were going into direct-to-dealer distribution. They were one of the earliest exponents of big-scale direct selling.

Within a year of the time this company adopted this form of distribution, their business had worked around to where ninety per cent of it was coming from dealers and less than ten per cent from jobbers and the few chain stores they had on their books at that time.

Their policy was a most deliberate one and a firm one which has never been changed. That institution today is carrying out its direct distribution scheme just as it started eleven years ago, but a very interesting thing has happened. Instead of the jobber business being but ten per cent of the total which it was after their first year of very intensive effort to make these changes, that jobber business has risen to where it now represents one-third of their business, while one-third is represented by the independent dealers, and one-third by the chain stores.

They tried to murder the jobber and couldn't do it, and being good business men, they allowed things to take their natural course.

I don't intend that you should draw from my remarks any defense of the jobber. I am simply citing a set of facts. Draw your own conclusion as you wish. At any rate, I don't think the jobber is entirely through and I don't think we are getting our share of his business. This business is subject to profitable cultivation and it is the present plan to aggressively go after it, particularly in Naca's natural area. Heretofore the company has been handicapped by inferior packaging and faulty sales solicitation. Both of these shortcomings are being rapidly corrected and we can confidently expect a better showing.

*Sales Organization*

Now a word about the sales organization. As stated before, we have four direct salesmen and fourteen agents. These four men

are young fellows, and most of them are relatively new to the business. We found it necessary to eliminate some of the older men inasmuch as we regarded them as being poorly fitted to the task at hand. These new men hold real promise; we can train them our way, and they have little to unlearn. We are in the process of adding three more, and expect to have them at work within the year. They will all be located in the 300-mile zone, replacing agents who have not given us satisfactory results. We are paying these men $200 per month and expenses, but I will not be satisfied until they are earning twice as much. It is my belief that $200 men cannot do a good job in this line of work and if I thought that these men could not develop into $400 salesmen I would fire them right now and try some others. There are two classes of men that I don't want—first, men who will permanently stay in the $200 class, for they are not good enough to get volume business; second, sophisticated nut and bolt salesmen, for they know too much about the nut and bolt business. I want men "who don't know it can't be done". It is through the latter class of salesmen that I intend to build up the sales of this business. I have personally worked this principle elsewhere and I know I can work it here.

We have developed a compensation plan for our men based on salary plus bonus. The bonus is given for performance against quota, with double and triple sales credit allowed for selling products of varying degrees of profitableness. The bonus is planned in such a way as to mean a lot to the men but, even in the aggregate, not to mean much to the company in the matter of cost.

As to the agents. We pay these men a flat commission on accepted business, the company reserving all acceptance rights. Of course, at the best, we get only divided effort from these men inasmuch as each one handles from ten to twelve other lines. Nevertheless their total sales for us is an important item, amounting to fifty per cent of the total in 1930. Furthermore they represent the only type of salesmen we can use in the outlying territory where freight rates are so seriously against us. It will not be long, however, before we entirely eliminate them from our 300 mile area.

Our system of reports and statistical records is now such that we know in detail what the men are accomplishing, and how they are working. We have a tight system of control, according to best modern practice, and I furthermore expect to spend several days in the field every six months with each direct man, and at least two

days a year with each agent. In the past, people from the home office here practically never visited the field from one year's end to another. Sales battles are fought in the field, and knowledge of field conditions is best gained in the field; the modern sales manager should spend from twenty-five per cent to fifty per cent of his time out of his office, and that is one reason why his health and age should be such that he can travel and work at top speed.

Our home office staff consists of one assistant, who handles advertising, promotion and correspondence of the sort that I handle when not out on the road. We also have one correspondent who handles routine matters, and one clerk. The correspondence is typed by the central stenographic force.

We believe we now have a compact organization, inside and outside, with the work definitely laid out and each member imbued with the idea that we are going somewhere. Formerly there was no check on the men in the field as to how many calls they had made, or how many they were supposed to make, and the odd thing about salesmen is that while they squirm under tight control, at heart they have no confidence in the company that does not give it to them. We believe our organization now has confidence in the company and in its future.

*Selling Methods*

I hope these remarks have tended to give you a fairly complete picture of the personnel and our plans for handling it. At this point I would like to say a few words about the selling methods.

In the past our selling story was foggy, incoherent and entirely of the emergency type. Furthermore, the men were primarily talking price, and allowed themselves to remain on the defensive where quality was concerned. We have analyzed both talking points and selling resistance and here are what we find to be the major elements:

*Talking Points*

Inherent *tested* quality (we have our quality certified by an unquestioned authority).

Service.

Finish.

Close tolerances.

*Sales Resistance*

Freight cost handicaps.
Reciprocal buying.
Naca's financial position.
Not considered a "volume" house.

Satisfied that these were the essential points, both ways, we proceeded to build a sound story to capitalize on the good points and sound arguments to combat the bad ones. We feel that we now have, for the first time, a logical, convincing sales story and we thoroughly train our men so they can tell this story the way we want it told. Knowing the type of men we formerly had, and the way they went about their selling job, I am inclined to think that Santa Claus worked 300 days a year for Naca—but finally got tired of doing it. From now on we are grown up children and don't believe in Santa Claus.

In short, we are directing all of our selling methods toward proving to buyers why they should deal with the Naca Company, taking the emphasis off price and putting it on quality and service. We do not expect buyers to pay us higher prices than they have to pay other producers, but we are no longer going to stress price as a reason for buying from us.

*Advertising*

In the past the company usually spent from $8,000 to $10,000 a year for advertising. There appears to have been no plan or program governing these expenditures and it is our opinion that the sums were largely wasted.

The new sales budget includes an item of $16,000 for advertising. This was established on the basis of two per cent of anticipated sales volume. I believe we need the $16,000 and can use it effectively, principally in building for next year and the next. I doubt if it will bring us a dollar of new business this year, and if we spent five times as much I believe the result would be the same.

We are making these points the keynotes of the advertising program—"tested quality", and "service". We are pounding home these points through a selected group of trade papers and by means of a consistent and continuous direct-by-mail campaign, the latter directed to a mailing list made up of carefully chosen prospects. As rapidly as possible we are adding the names of the proper indi-

viduals to the list, with the idea that within another six to nine months all material will be personally addressed. When completed, this mailing list will be one of the company's most valuable assets. Part of the present year's advertising appropriation is being spent in building this list.

We are engaged at the present time in selling the merit of this campaign to our own salesmen and to the jobbers. A vital part of the value of any campaign is lost if the organization and the trade are only half-hearted in their belief in it, and we are not taking any chances on this point. This form of activity represents but one example of the execution of the new policy which calls for complete coordination of sales and advertising effort.

*Selling Costs*

As stated a little while ago, the total expense budget for the present year is $90,000 made up as follows:

| | |
|---|---|
| Agents' commission | $20,000 |
| Salesmen's salaries and traveling expense | 28,000 |
| Sales Manager's salary | 9,000 |
| General sales traveling | 3,000 |
| Advertising | 16,000 |
| Clerical salaries | 5,000 |
| Miscellaneous Expense | 5,000 |
| Total | $90,000 |

The percentage break-down shows field cost six per cent, advertising two per cent, and general selling overhead 3.25 per cent, or a total 11.25 per cent of budgeted sales. The percentage is high for the present year but it will drop steadily as volume rises inasmuch as a considerable amount of increased volume can be done with approximately the same fixed overhead, and even the field cost will not rise in proportion. The 1932 sales budget calls for a twenty per cent increase in volume and on this basis the sales expense budget shows a drop from 11.25 per cent to 10.8 per cent. Eventually we can bring it below ten per cent.

*In Conclusion*

Now permit me to hastily recapitulate the situation as a whole, and endeavor to indicate why we are confident we can attain our

$800.000 sales budget for 1931 and secure a minimum increase of twenty per cent in 1932.

The industry itself is sound and stable. Gas and electric welding has made great strides but it has injured this industry to no considerable extent except as regards the rivet division. Imports from other countries represent no threat of consequence, and there can be little doubt that while the industry can anticipate no great expansion over a period of years, nevertheless it is sound at the core.

Your company's products are in good position to compete within Naca's natural operating zone, and we have laid sales plans in such a manner that we have a right to expect the entire sales increase to come from this area regardless of any increase from agents' territories.

Summing up the features of this plan, upon which we maintain you are justified in placing your reliance, we have—

(1) The new budgetary plan of control. This in itself will be helpful and stimulating.
(2) Territories more effectively laid out from an operating standpoint.
(3) Sane and sound quotas for every sales operating unit.
(4) New and better type of salesmen.
(5) Additional volume from three territories by changing from the agent to the direct salesman type of representation.
(6) A sound compensation plan designed to stimulate the field men to sell the right kind and the right amount of goods.
(7) Better control of selling activities through records and statistics, and through more personal contact on the part of the sales manager.
(8) A better sales story, told in a better way, by better salesmen.
(9) A new campaign on jobbers where Naca has obviously not been getting its share of the business.
(10) A new and better advertising program, and one in which the sales organization has faith.
(11) A more compact and efficient home office sales organization.
(12) Better coordination between sales and advertising activities.
(13) A new sales manager, for whatever you think he is worth.

(14) Better morale on the part of the entire sales personnel.
(15) In general, a well-balanced and sound sales program, and one which we are prepared to energetically execute.

Add to these points the fact that the next broad movement in general business conditions cannot fail to be in our favor, and we believe you have a combination of factors that would seem to insure at least a twenty per cent increase in volume in 1932. This is more than likely to be true in view of the fact that Naca's history shows that it is hit early by, but recovers early from, periods of general business depression.

In any event I can promise you that the unstinted effort of the entire sales personnel will be devoted to the accomplishment of our objective.

MR. JAMES: Well, I know by two indications just how much you thought of Mr. Dick's talk. In the first place, this room is practically full this afternoon and this is the second day of the sessions, it is a beautiful afternoon, and I have attended a good many sessions of the National Association of Cost Accountants and on Wednesday afternoon the session is usually marked by the golf players who are not in attendance. As I have looked over this room, I have seen most of my golf-playing friends sitting out there listening to Mr. Dick, and the enthusiastic applause you gave him indicates that you appreciate the very definite, precise, and clear exposition he has made of our sales problem.

The first thing to do in setting this business of ours in order is to get our facts. I think our new sales manager has done a wonderful job on that. On behalf of the Association, we thank you, the board of directors thank you, and the Naca Manufacturing Company is going to build up business on the strength of your advice.

Mr. Dick will now introduce some of his business associates and friends who will tell you what has been accomplished by the type of sales organization that is scientific, modern and effective.

MR. DICK: In our investigation of modern methods and what they might be expected to accomplish for our institution if adopted, your president and myself went around the country and called upon several manufacturing institutions. We were very decently and graciously received and we gained much helpful information as a result of that study.

We doubted our ability to clearly pass on to you everything that we learned, but we thought you would be very much interested in hearing some of the things we heard, and in the case of two of the institutions we visited, the executives that we talked to were gracious enough to say they would be glad to come before you and tell you what they told us.

Now, the first gentleman who will address you is the general sales manager of the Gifford-Wood Company of Hudson, New York. The Gifford-Wood Company, as many of you may know, is a leader in its industry and in this particular case we found that some very interesting results had followed the application of new principles to an old business.

This gentleman has been with the Gifford-Wood Company about two years. Originally he was a reporter on the Brooklyn Eagle, then he became advertising manager of the Charles Williams Stores, and later became assistant manager and sales manager of the Johns-Manville Company. His present position, as I said, he has held for some two years, and it is under his administration that these very interesting and enlightening things were done. I know you are going to be very much interested in hearing what Mr. Christie is going to tell you.

## BUDGETARY CONTROL IN ELEVATING AND CONVEYING MACHINERY DISTRIBUTION

GEORGE V. CHRISTIE

General Sales Manager

Gifford-Wood Co., Hudson, N. Y.

I HAVE a great deal of pleasure, Mr. President, and board of directors of the Naca Company, in coming here and telling you of a few things that we have done.

I am a little bit taken back, to tell you the truth, in being introduced as "Mister", because over in the mysterious books in our Treasurer's Department, I am a "General." I am a sort of general sales expense and it is rather nice to able to talk out of turn.

Our company, the Gifford-Wood Company, was born just after the close of the War of 1812. We are in our one hundred sixteenth

continuous year of doing business. Our president today, young and strong, active, more of a salesman than some of our own that we call salesmen, is a great-grandson of the man who founded our company.

We were born with and grew up with the natural ice industry, the old fellows that used to cut cakes of ice out of the lakes and rivers and store them away. We followed through with them until, by and by, manufactured ice supplanted natural ice, and again we kept in step with them as best we could.

On top of that, the coal dealers of the country began to find that there were methods of storing and handling coal which would permit them to buy at the low prices during the spring and summer months and hold until the heating season came and sell at the standard prices. And so we developed methods of conveying, elevating, and storing coal and thus entered a new industry.

It became increasingly evident, however, that new days and new times required new methods and the active operating head of our business began to turn the spot light on his whole outfit. That included every department. That included all of the shops which made up our plant which nestles down in the hills along the Hudson River, the most amazing place you ever saw, out in the country and no farmers running it.

He asked the question, "Why?" in every department. Just plain "Why?" Why this? Why that? And the answers that came back were a multitude and gave a lot of food for thought.

I will restrict my discussion of this to just the sales. Before the question was asked, the question, "Why?", we had offices in Boston, Pittsburgh, Chicago, New York, and San Francisco. Our organization was pretty far-flung. We had one plant at Hudson, New York with which to supply the demand raised by all of these offices.

Our men, under direction, were crossing wires. Two men were calling on the same plant, one to sell a conveyor and the other to sell an elevator. Our sales expense was naturally high but business was good. As you all know, there was a day not long ago when business was not hard to get and the capacity of a salesman was never tried and tested as it is being today, and consequently everything was rosy, lovely. And then hard times came when everybody in our organization and every other had to get down to hard pan and it was a question of root hard or die for everybody.

Well, the question, "Why?" was applied to the Sales Department and sales expense. Why eight cents a mile for cars? Why four dollars worth of laundry? Why no itineraries? Why monthly sales expense reports? A big string of "whys" and the answers were fairly evident.

But the management felt that it should support its own views with those of an unbiased expert organization of analysts whose experience was not limited to the elevating and conveying industry, but who could bring to us their combined experience in a number of industries. And in every case the answers of both of these groups coincided entirely.

I won't bore you with a lot of ancient history. After all, history isn't any good, as Henry Ford says, unless it teaches us something. It is just like experience. We had our troubles. Our company was amazingly prosperous. I am happy to report that every month in this fiscal year and every week of this month we are in the black, and what's more, we are going to stay there.

We made our changes. I will enumerate a few of them for you, although I would like you to bear in mind that I am not standing up here telling you what enybody else can do. The fundamentals of what we did are sound as a nut and anybody can apply them, but the application naturally would differ in the case of nuts and bolts or somebody's ham, or whatever it might be.

Granting that most everybody owns an automobile, particularly young men, and that whether they used their cars for sales purposes or not they would still have them, we put our mileage at six cents. We know they can't run any car for six cents a mile but the six cents we give them is a big help toward the maintenance of that car. That is our attitude.

We insisted on weekly, not monthly reports of salesmen's traveling expenses. It is hard enough to keep them weekly, I know, and to try to keep them by the month is literally impossible, and when we did that we just had a bunch of novelists instead of a bunch of fellows that were keeping their accounts correctly. And so we turned to weekly expense reports. We allow one dollar for pressing, and if they give the valet a quarter tip, they have to bury that some way, it must not show. Of course, if they go climbing over a coal pocket, and get greasy and dirty, due allowance is made for that, but they have to explain it.

We allow them two dollars for laundry because I won't have a

salesman that starts out Sunday night with a bag full of dirty shirts and puts it on our bills. He must start out with clean clothes, and if he gets them dirty, two dollars is plenty for his laundry bill.

Those are the only restrictions we made on the way they had to handle themselves and our company's money. It is interesting to note that the reduction per week in salesmen's traveling expenses due, not to these two things I have mentioned, but to the moral effect of knowing their accounts are being watched, has been thirty dollars per man. You wouldn't think that is possible, but it is so.

Well, that was the small end of it. The criss-crossing of men, the double calls on plants, the long distances that they drove instead of taking railroads, all began to get the spotlight of inquiry. And we put our men on individual restricted territories, and not too restricted because our business is not done with jobbers; it isn't package goods. Our unit of sales averages $25,000 and believe me, a coal man looks at his bank book pretty carefully before he spends that much, and the salesman has to stay with it.

None the less we said, "You go to this territory, Landis, that is yours. You are the sales manager of your own territory. Do not depend on advertising. Do not depend on lifts here and there for inquiries for new business. When you call on them you yourself will know whether they fall into Class "A", "B", or "C" customers. "A" customers are customers who have money and the desire. "B" customers have the desire and not so much money. "C" customers go by. We don't want them at all. They haven't the credit.

Consequently, our men built up their own prospect lists. Heretofore, they have asked their offices to follow up their calls by letter, but that situation has changed. When I call on anybody, I sit down in the hotel and write them a little thank you note that night. It is just as easy if you make five calls or twenty, to write a few sentences. So our men are doing their own follow-ups, and if they lose a job they catch it plenty. As a matter of fact, I would say that in the last two years, there have not been three jobs let unbeknownst to us, which attests to the efficiency and satisfaction of that system.

We divided our men into two departments. The coal is big because it is big volume. We couldn't ignore the manufactured or the natural ice industry, first because that is our first love. We haven't a single customer, in the natural ice industry, but we have

a lot of friends, and that is what counts. We can go to our files today and tell some of those old time ice men what their grandfathers bought from us at the end of the Mexican War, and we can supply them with the identical equipment, too. We had to cover those too so we established an Ice Department to supplement the Coal Department.

Our men had been quite content with straight salaries and traveling expenses, with no pressure from the inside, but we determined on a compensation plan which would allow them a commission varying with what they sold for full price jobs. They are not allowed to cut a price anywhere. That comes back home and if, for policy reasons, or any other season, we decide to take a job at less than our standard prices, the salesman gets no commission. And in passing may I say our standard prices are averaging fifteen to twenty per cent higher than our competitor's prices, although not for similar quality material. Cut price jobs mean no commission. Our men, therefore, fight day and night, while formerly they fought all day for their jobs.

As one of them told me, and to put it in his own words, "George, before you put this plan in, when I lost a job I went out to the curb to my car and felt kind of sour for a half-hour and then went on to the next. Now I won't let them alone". And that boy doubled his pay last year.

So we established a compensation plan that would give them adequate return for the effort that might be put forth.

On repair business, which is a big question with many companies, we only give a commission where the salesman secures the order and sends it in. I have four men who have bought rubber stamps which they put on their letters, "Please send repair orders to me".

Ice tools, which are a very large part of our volume, ice tongs, ice picks, shavers and articles like that fall under the same classification. If the salesmen secure the orders, they get the commissions. If the orders are sent in direct to us at Hudson, there is no commission. That assures us that our men cover their trail.

We pay no commission to our agents, of whom we have eighteen. They are spread all over the country. We are represented on the Pacific Coast today by an agent. Our Pacific Coast office has long since had a "Rest In Peace" sign on it and so has our Boston office. We maintain our two branches in Chicago and New York and headquarters in Hudson, and that is ample.

I am necessarily telling this in a sketchy manner, gentlemen. There are others to follow me and I won't intrude on their time. I want to step over to advertising now. We cut our advertising appropriation thirty-three per cent and increased our advertising seventy-five per cent. That is not a puzzle, really. We made it so much better looking than it had been before that it looked like that much more.

We bought inserts in publications and then overprinted them, took a block of type out of them, put a pre-cancelled stamp where that block of type had been, folded them, and mailed them to every retail coal dealer in the United States. Our advertising does double duty; it is publication advertising and also direct by mail advertising.

You will be interested to know that in connection with a unit which we call a field saw, which is a motor saw for cutting cakes of ice out of lakes and rivers, we published an advertisement in a small publication in New England last fall. Two of those were torn out, a check pinned to them, and they were sent to Hudson. Two sales with no sales expense, just straight sales.

We have insisted to ourselves and cooperated to the last degree with our advertising counsel, in preparing actual selling advertising. I do not want our men to have to go any place and sell their company. That is a waste of time if we advertise. It is up to the advertising to do that for them, so that the minute they go in they are selling a product.

One thing more you may be interested in is the fact that our mailing list has less than two per cent wrong names on it and we invariably mail to an individual. I would say that in eighty per cent of our mailing list we have the name of the individual, such as John Smith, Eureka Coal Company, St. Louis, Missouri, and the street address. We know at least that advertising will reach the man. If he throws it in the wastebasket, we can't help that. On the other hand, we don't know whether he would take the trade publication out of the wrapper in which it was mailed.

You will be interested, of course, in the matter of volume. Let me go back one year because last year was the hysterical time of the depression. Some of us are still hysterical, but we don't really need to be. The depression is still here; I am not unduly optimistic in that regard.

Until July of last year our men secured and our company built eighty per cent of all the coal pockets let in the country, and that is at twenty to thirty per cent higher price than any competitor could show. There are two reasons for that; one is the product and the other is the salesmanship.

Directly in connection with that, the fore part of last year, when this program was instituted, in four months we spent the whole year's budget on development. We kept our patent attorney in Washington just like a shuttle cock, back and forth. We made it our purpose to put our equipment just so far ahead that it would take our competitors years to catch up to us. Consequently, we don't have to talk competition. Our men don't have to do that; they have to talk what they have to sell, and what they have to sell is the best we can possibly give them, whether it is a pair of ice tongs or an elevator that will lift three tons of coal in forty seconds to a height of eighty feet.

We have put forth a great deal of effort to be sure that we were in good condition. The net result has been that our volume last year maintained a fairly close level with the volume of the previous year, and permitted us this year to survey our costs, our sales expense, which is not an unimportant item, our factory overheads, and establish true costs so that for the first time in our history we are able to put out list prices less discounts to various classes of trade.

All in all, it has been very satisfactory. I wouldn't say that we are rolling in wealth from new business today because we are not. We find that St. Louis and that area is the most active of any in the whole country on our business. Others may find it entirely different. We find that there is enough business there to keep our plant full until late fall of this year.

We have diligently searched for other outlets for our gray iron foundry, for castings, and for our steel shop, for fabricated steel, and work that we secure from other and outside and non-competitive companies is bearing a very great part of our overhead. We have made two blades of grass grow wherever we could find the second one to grow beside the first.

As for our personnel, we have insisted that every man whose job it is to sell, sell. We will not carry any drones and we don't. And the same is true with everybody in the organization, down to the stenographers and clerks. Wherever possible we double up on

work. We would like to give employment to as many people as we can. We are profoundly convinced that the crux of the whole situation all business faces today lies right there. As our volume increases, our efforts in that direction will also increase.

Now, ladies and gentlemen, this has necessarily been a somewhat sketchy outline, and it could, without much of a stretch of the imagination, sound like bragging. Nobody is bragging. We haven't had anything to brag about yet. We merely have discovered what lots of others are discovering and have themselves discovered, that easy business means easy business methods, and that there were lots of soft spots in the apple which needed to be cut out, good times or bad.

That is the whole story, I will be glad presently to answer more definitely anything that anybody would like to ask me.

MR. DICK: The next gentleman who is going to address you is Mr. R. G. Knowland. Mr. Knowland was graduated from the Massachusetts Institute of Technology in 1916. After the war he became a member of the Lewis-Grant, MacDonald organization as a consulting chemical engineer, with headquarters in Boston. In 1922 Mr. Knowland established his own business in Boston as a consulting chemical engineer, working principally in the field of textiles and paper.

In the beginning of 1929 he joined the Bigelow-Sanford Carpet Company and he is now vice-president and general manager of that institution. As you may know, the Bigelow-Sanford Carpet Company is one of the largest manufacturers of rugs and carpets in the world. It has been for many years a leader in its industry. Like many old businesses, and just as Mr. Christie recited in the case of the Gifford-Wood Company, many practices had grown up that were a little out of date.

I happen to know something of the work that Mr. Knowland has done with the Bigelow-Sanford Company and it gives me great pleasure to introduce to you Mr. R. G. Knowland.

# THE USE OF COSTS IN SELLING IN THE CARPET INDUSTRY

R. G. KNOWLAND,

Vice-President and General Manager

Bigelow-Sanford Carpet Company, New York City

IT gives me real pleasure to talk to you gentlemen this afternoon. This is the first time I ever had the opportunity of talking to several hundred cost accountants at one time. I do have the pleasure at times of talking to a lesser number, and it is with great relief that I find I am in a position where so many hundreds cannot possibly talk back.

The use of accurate cost accounting in manufacturing is so well established, and the results so generally known, that it is difficult to account for the failure of the average concern to regulate its sales on a like basis and by similar methods. The means employed in setting production costs have developed procedures that naturally fit equally well into the control of markets, of sales methods, and of sales costs under varying conditions. In these days of difficulty in merchandising at a profit, it is especially necessary to know, not only where the most favorable market lies, but what makes it favorable and why. Obviously, the most favorable market for any company is that which will yield that particular concern the largest net return. Under this definition, the cost of selling to that market may become nearly as important as the cost of manufacturing. In any event, the market and its peculiarities, together with the most effective means for approaching it ultimately, can be determined best by the principles employed in costs. Furthermore, once these factors have been established and the sales program put in effect, the latter can be effectively directed only by the continued use of cost principles.

This brings us to a brief consideration of the necessity for having always at hand a complete picture of the extent of trends in sales operations as well as in manufacturing. The balance sheets of a firm show only its static position as also do ordinary records of sales. If one relies only on such records, the tendency of a company toward a stronger or weaker position can hardly be determined. The result is likely to be an ex post facto finding of failure. If however, analytical cost methods are applied to sales as well as

to production, and the figures continually compared with similar past records, the trend of a concern becomes known at all times. With this information, an able management can keep its affairs in control so far as the limitations of the situation permit.

These facts are borne out by a scrutiny of the series of balance sheets of the Naca Manufacturing Company. In view of a shrinkage in surplus of some $175,000 over a five year period as evidenced by five statements, it is obvious that the corporation has run down hill rapidly, but no evidence is indicated as to the causes. Perhaps manufacturing costs are too high to meet competition; perhaps local or general phases of the distribution costs are too heavy; there may have been a loss in volume or too much volume at too low a margin. No clue is shown as to cause or proper remedy. This condition is typical of any concern which does not so apply cost principles to sales and production alike as to reveal clearly at all times the rate and extent of progress.

In the following discussion, the application of cost principles to sales is assumed to cover not only the use of costs for regulating sales but also the employment of methods similar to those used in deriving costs for determining the basic facts underlying any sales problems.

In the instance of our own company, the background against which was built an application of cost methods to the control of sales was formed by many years of successful use of accurate cost analysis in the manufacturing end of the concern. It should be said that job cost methods, while desirable for many purposes, are in general too unwieldly for the complexity of conditions encountered in textile manufacturing and particularly for the carpet industry. Consequently, a former job cost system was replaced a number of years ago by the standard cost method applied to each operation. You have already heard a description of such systems and, therefore, understand the implication.

The barometer system for making monthly comparisons of the actual costs of each operation with the standard costs was employed. Over this system was superimposed a simple plan of bonus payments to overseers in order to provide inducement to maintain actual costs at or below the set standards for the respective operations. This method of cost control in production is in successful use in all three mills of the company and has a long record of most productive results. It serves not only as a check on operations, but

for measuring the productive activities of staff men engaged in engineering or other improvements as to method or material; as well as forming a basis for estimating costs when the semi-annual budgets are prepared.

In view of the successful use of cost principles in production, it was quite logical to introduce methods for ascertaining and regulating the economics of the sales problem similar to those employed in deriving the basic facts which underlie the production cost system.

The major subjects about which were centered sales control methods may be listed as follows:

1. Analysis of markets.
2. Determination of best approach to markets.
3. Establishment of territories and quotas and required number of salesmen.
4. Salesmen's compensation.
5. Cost of marketing.
6. The budget.
7. Inventory control.

An analysis of the market is the first step in laying the foundations for the regulation of sales. This analysis, in our case, was based on an examination of the company's records as to:

1. Distribution of sales volume between distributors and direct accounts.
2. Geographical and transportation problems.
3. Classes of customers handled by various types of dealers.
4. Character as to preferred style, price, etc., of goods.
5. Underlying reasons impelling retailers to buy through distributors in one case or direct in another.
6. Determination of volume necessary to make an account advantageous, and vice versa.
7. Preliminary determination of normal retail price brackets for those products made in large volume.
8. Extent of demand for price merchandise.

Other related items might be mentioned, but the above cover the most typical.

At this point, an outside consulting organization was called in to examine into some 17,000 retail outlets throughout the United States. Their investigators were instructed to gather information in each outlet as to:

1. Names of buyers.
2. Character of store: large, small, good, medium, poor appearance, etc.
3. Kinds of floor-coverings handled—rugs, carpets, cut carpet, linoleum, etc.
4. Names of brands of rugs and carpets carried.
5. Opinion of our sales policies, of our dealer advertising, of our consumer advertising, of styling.
6. Quantities of floor-coverings handled annually or by seasons.

Replies to the investigators were found to be fairly accurate for the stores approached. Within a reasonable space of time, a background was thus established which indicated the character of the outlets, their sizes, goods carried, attitude toward the company, and similar related matters. On the basis of this investigation, there was set up a consumer's file planned not necessarily on the expectation of trying to sell so many outlets, but on a rather full knowledge of the entire national retail situation.

In the interview, a firm, skilled in such work, aided in examining thoroughly into the set-up of all administrative and sales functions in order to obtain a check on whether the plans and measures already in effect or proposed were sound; and to determine on any other advantageous steps which they might uncover.

This move was extremely satisfactory since it resulted in developing a well-rounded form of organization and of general methods. It also brought to light for the first time features of the market and organization which required attention. These measures, covering market analysis and company set-up, led to another stage in the problem which may be briefly described by the term "approach".

In any sales program, besides determining the market, it is necessary to lay out the best means for reaching that market. Included under this general subject are such vital matters as the determination of the best locations for district sales offices; the limiting sizes and the number of national trading centers with their locations and means of transportation; the number of men required

to reach each class of customers, and, among many others, the separation of accounts into classes with reference to the number of calls required per season. Only the few typical items, as listed above, are mentioned for brevity's sake. Many related questions must be answered before deciding finally on the best approach to a market, since it is only by a reasonably thorough analysis of this sort that the handling of sales can be conducted economically.

However, that important question of the cost of reaching the market can be estimated only after these steps have been carried out. And obviously a company should, in general, pass over any part of a market which it cannot sell with a profit.

Where it is expected to sell both direct and through distributors, it is readily noted that the approach to the market requires analysis of both methods of selling the particular product at hand. There is needed a classification of data, especially for a complicated line of merchandise, which will show as conclusively as possible, the way to correct distribution. For such classifications of information, our company found that the general methods used in cost calculations were quite as valuable as they are necessary in the final computation of estimated sales expense. Consequently, cost methods were utilized in determining the proper mode of distribution.

As a corollary to the determination of the best means for approaching a market, there must be made a general survey of the entire sales field in order to establish the proper sizes of the various districts, the assignment of territories to salesmen, and the remuneration of salesmen. Among the factors which influence such operations are the number of calls a man can make in each territory, the total number required per season, the average cost of travelling in each territory, and all related items. Based on a full knowledge of the quantitative effect of these factors, the final contribution has been made of the data necessary for figuring direct sales costs.

In this connection, no mention is made of determining the proper amount and kind of advertising or sales promotion effort to be used, since these activities cannot so readily be catalogued and analyzed as can direct sales expense items. Rather, both subjects usually must be treated on the basis of fixed appropriation believed to be correct for the purpose at hand. While, as stated above, it is generally not possible to determine exactly the proper ratio of advertising and promotional expense, obviously there are many factors known to any well-managed organization which indicate,

initially, the ratios required to support direct sales effort or to meet specific problems. Usually, the results of preliminary advertising and promotional work will establish the returns to be expected from efforts of this nature. When such results are known, it is then possible to add to sales costs a fixed percentage in order to cover the necessary promotional or advertising work. However these items are established, and on whatever basis they are placed, both advertising and promotional work must be figured into the sales costs.

This procedure was, of course, followed by our company and completed the last step required for a well-established budget.

This introduces one of the most important subjects that any concern, confronted with present-day conditions in merchandising, can face. Back of all sales and production control lies the requirement for a budget. Even where the data for establishing a sound budget is, in part, lacking and assumptions must be made, it is nearly impossible to operate successfully without budgeting both sales and production activities. Where sales have been reasonably well forecast, so as to fix the probable sales volume of each kind of goods made as well as the total volume, a budget serves, among others, the following purposes:

1. Permits the fixing of plant overhead on a proper basis for absorption into the costs of the goods to be produced.
2. Fixes the total of and the distribution of sales and administrative expense.
3. Makes it possible to arrange in advance and to figure into cost, if desired, any given amount of advertising and promotional expense.
4. Furnishes a standard for the costs of each department in the company against which may be checked the actual expenditures for each department. This dual function of the budget in furnishing, not only a course for steering, but also a standard of reference for keeping departmental costs in line is of outstanding importance.

In our own case, a budget based on a careful study of the company's needs and of the probable volume of sales was established a number of years ago. It is now brought out twice a year, the sales volumes forecast for each succeeding six month's period. It covers, among other items, the following points:

1. Cost of sales (manufacturing costs).
2. Direct sales expense.
3. Advertising.
4. Sales promotion.
5. Administrative costs.

Under item one, the same budget, when broken down, indicates the allotment and amount of:

a. Mill overhead.
b. Raw materials.
c. Labor, direct and indirect.
d. Heat, light, process steam, power, etc.

The accuracy of a budget is, of course, no better than that of the forecast of sales. The first trial is likely to be abortive, the second fair, and the third much better. This is our own experience and tallies with the experience of many other companies.

The budget is and must be based entirely on cost methods. Once a forecast of the probable market has been made by the Sales Department, the setting up of a budget becomes purely cost work. In no more important phase of corporation management can a good Cost Department function than in this matter. We have found a budget to be absolutely essential for the laying out and for the conduct of managerial procedure.

Passing over the budget with the preceding remarks, in conclusion, something about our experience with inventory control may be of interest. This is speaking of the control of finished goods rather than of process inventory. The latter is a subject sufficiently obvious and frequently given plenty of the limelight so that comment here is hardly necessary. The control of finished goods inventory must be such as to serve several purposes. These may be detailed as follows:

1. To provide a sufficient stock of those goods expected by the trade to be available for immediate delivery.
2. To cover adequately all grades, sizes, and patterns, of the products made.

The finished goods inventory must be limited:

a. To require the minimum amount of investment consistent with item one and two.

b. To the minimum consistent with the economical order quantities required by the mills.

In the case of nuts and bolts, while this inventory problem is as important as in any industry, it happens to be simple. In the case of styled fabrics where sales can hardly be predicted for any particular pattern, where there are a dozen or more lines, and hundreds of separate patterns, each pattern being made in from six to ten sizes, the matter is complicated. Finished goods inventory then becomes of importance to the treasury, to sales, and to production alike. It also entails the use of costs to develop the minimum economical ordering quantity for each class of goods manufactured. Based on sales experience, the Cost Department must develop a charge to cover losses on drops or discontinued merchandize and imperfects. In fact, the application of cost methods to the control of finished goods inventory, at least for a complicated industry, is unavoidable from the start.

Our company, faced with this problem in about the form described, has so handled it. The results have been satisfactory and a logical basis for inventory control has been developed.

Finally, after the somewhat rambling discussion which goes before, it may be repeated emphatically that merchandizing at the present time requires the use of cost methods quite as much as does production. This must not be taken to indicate any leaning toward the "isms" of theorists, but rather toward the practical application of sound cost principles to the control of sales.

MR. DICK: Well, that fine talk was such a splendid companion to the preceding one that I think it rather clearly indicates to you that it is possible to apply to sales work many of the principles that you gentlemen have so successfully applied in your production accounting procedure.

It has been my experience that accountants generally have been a little diffident about taking up this subject of accounting for sales and taking the initiative in that matter to the extent that I believe their training and background so well fit them to do.

We all know that sales costs have increased while manufacturing costs have been receding. Modern accounting has done a great

deal to bring about a reduction of costs in manufacturing in the last twenty years, and surely a job of equal importance lies ahead for somebody to do. In my opinion, accountants still have a job cut out for themselves on the sales side of business.

I cannot understand why accountants are not, by temperament and training, ideally fitted to cope with this job. I don't say it in any spirit of flattery, but our experience shows that we get about the straightest thinking and the most helpful suggestions from controllers and cost accountants that we receive from any class of executives that we contact in our work. I only wish that accountants realized their own worth, and their possibilities on the sales side of business, as well as we do. We are outsiders to you and possibly can see things of this sort that you yourselves don't see.

Cost accounting and sales research are the natural husband and wife of the sales analysis family. I believe that until all the given circumstances are known in any set case you cannot lay down a broad rule as to where accounting should leave off and the work of the Sales Department should begin in the matter of analysis work. There is this much, however, that is dead certain: A new accounting problem has arisen in business and I don't know anybody better fitted to cope with it than accountants. Twenty years ago production needed your talent, called for it, and got it. I think sales work needs it even more today.

The factory with its planning schedules, its time records, its cost records, has a set of equipment that the Sales Department finds it hard to match. I think the methodical factory tortoise outstripped the hit or miss, temperamental sales hare, both in methods and in results. But a big change is coming. We are all getting a little more research-minded, we are getting a little more definite-minded, in our approach to all business problems. Within the present century we have had five very important tools adopted by industry: mass production, technical research, cost accounting, advertising, installment selling; and now sales research is coming along.

One of these days you are going to see business institutions with their own sales laboratories the same as they now have their technical research laboratories, and because the question of analysis is so closely associated with the question of research, it is going to give a great impetus to the whole question of cost accounting for sales.

I don't believe for a minute however, that the factory job is done. We may wake up some morning and find we have to do it all over again. Here we have Soviet Russia with a threat to world commerce at which none of us can afford to sneer. We may wake up some day and discover we have to find ways and means of keeping dry without the use of the tariff umbrella. And we may find a new crop of small manufacturing companies coming along. Experience shows that the little producer, provided the company is well-managed and has low overhead, has many advantages over the more complex and more unwieldy large companies.

Those three conditions, and probably many more, would certainly throw out a challenge, it seems to me, to production engineers and to accountants to take another notch in their belts and proceed to play new tricks in bringing costs to new low levels.

Now, I haven't the slightest doubt but that if that challenge comes along to you, you will accept it with alacrity. I wish I could feel with equal confidence that you are ready to accept the challenge that advertising and sales are flinging in your direction. The job is there to do. There is nobody better equipped to do it, it seems to me, than you are. I think eventually you will be doing that job, and I am just wondering why not right now? I would like to see a little of your usual vision and courage applied to this question of opportunities in cost accounting for sales.

I think just a little bit of an inferiority complex has operated with many accountants when they have thought of this subject. When they do try to get into the field, they go about it a little apologetically, and approach it with their hats in their hands and go to the sales manager with the attitude of, "Well now, pardon me, I know I don't belong here, but Mister, won't you please buy some apples?" You can't sell a sales manager anything that way. He is a better salesman than you are, and you have to have a lot of confidence in yourself. Probably he can yell louder than you can and you must get at him accordingly, and handle him accordingly.

MR. JAMES: If there is any one thing that these organization meetings of ours should do, it is to broaden our horizon. Here is a field that is the most important in industry today. It is lying fallow for the cost accounting profession to get into. It is a challenge to each one of us and I hope you will take that message home with you and keep it close to your hearts and remember these in-

spirational words of his. Let's set down for the future meetings of the National Association of Cost Accountants the development of cost accounting for distribution in industry.

We have only thirty minutes for the discussion this afternoon. I know there are a great many who want to ask questions on sales and I am going to ask you to confine your discussion strictly to matters concerning sales and advertising distribution. Let's not get off the point but talk directly to that particular question.

MR. WYLLIE: In regard to this jobbing business, Mr. Christie, if you were to take on to fill up your capacity, for instance, a foundry and fabrication shop, would you find that profitable? It has been my experience that many concerns kid themselves into believing that it is profitable business and that they are reducing their overhead, whereas, as a matter of fact, it usually proves to be a loser. Furthermore, it is the toughest kind of competition for the legitimate manufacturer who knows his costs.

MR. CHRISTIE: We have found that we could readily make the mistake of taking on jobbing business as a contribution to overhead, but we didn't make that mistake because we culled the wheat from the chaff and the only business taken has been taken at a profit.

C. C. RIGGS (*Factory Accountant, H. L. Judd Company, Wallingford, Conn.*): May I ask what you call a profit, or where the loss begins in that particular situation?

MR. CHRISTIE: There is no sales expense. Our cost on jobbing work, Mr. Riggs, is all figured as an overhead factor, plus a factor for profit. There is no factor whatever for sales expense, because in nine cases out of ten our plant superintendent and our foundry foremen get the business.

A. G. BLOCK (*Secretary, Barnes Drill Company, Rockford, Ill.*): I would like to ask if you had any success in establishing sales budgets in that type of product?

MR. CHRISTIE: That is a good question. We have had. As a matter of fact, every week we get our list of expenses against the

budget. Perhaps I can better answer you if I tell you that with the exception of general sales, the two offices all the way through are slightly below the budgeted figure month by month, and general sales is merely over because of additional traveling expense.

I would say that our budget arrangement, as established by our auditor in consultation with our Sales Department, has been entirely satisfactory. Does that answer you properly?

MR. BLOCK: I primarily had in mind the volume.

MR. CHRISTIE: That, of course, would follow. We took an average of five years for volume. We laid our plans as far as numerical personnel, amounts of compensation, and so on, were concerned. We have given each branch a certain amount that it must sell each week in order to take care of budgetary demands. On that basis my first remarks still hold good. In other words, they are reaching volume.

A natural corollary of that is, if we put the volume too high, too low, or where have you, it has to be adjusted. And I will have to admit we did some guessing, all of us, but we happen so far to have guessed fairly correctly.

MR. JAMES: That means, now, the volume of this jobbing work?

MR. CHRISTIE: I took it he meant total volume.

MR. BLOCK: I meant the total but I was referring primarily to those heavy duty machines which are more difficult to budget.

MR. CHRISTIE: We know we have to sell so many trolley buckets a month, and so on down the line. It has all been doped out.

G. A. TORRENCE (*Secretary and Treasurer, Interstate Bakeries Corporation, Kansas City, Mo.*): I want to ask Mr. Dick a question about the nut and bolt business. When you have the quota for a territory, you would set that against the salesman or against the customer. But this customer may buy exclusively from one source of supply, or he may buy from two or three.

MR. DICK: It was put against the territory, not against the customer. Of course, if it is put against the customer, in principle you can determine the potentialities in the territory, but the customer does not buy exclusively from one source of supply as a matter of general practice. He may have several sources of supply.

There are the big volume buyers such as the railroads and big public utilities, (and I should have told you that when I spoke of industrials, I was including railroads and public utilities, differentiating them from the jobber). The jobbers buy from a great many sources of supply. Some of the big volume users are rather inclined to buy in one place, particularly if the question of reciprocal buying is a controlling factor as is so often the case.

Have I answered your question?

MR. TORRENCE: Yes and no. You answered the question, at the same time raising another. In general, is it practical to set a quota against the customer where you are not the only source of supply?

MR. DICK: I don't think you can be that specific. Again I say that in setting controls, you have to believe you are going to get a certain amount out of each one of these customers, but you have to play the law of averages on that because you know some customers have two or three or four sources of supply and you will be lucky if you can get much more than twenty, twenty-five, or thirty per cent. Some of them are going to try to get it all if they can, but I don't say specifically that you can lay a quota against that type of customer. I don't think it is done as a matter of practice. It certainly is not my experience that it is practical to do it.

JOHN R. MORSE (*Apex Electric Manufacturing Company, Cleveland, Ohio*): I would like to ask Mr. Dick how he would handle a budget for new products. For instance, the development in the electrical manufacturing industry today is so rapid that it is almost impossible to foresee the amount of sales in the new product. Should that be carried as some development account or would you attempt to put it in the regular budget?

MR. JAMES: Let me say that is a question, I think, of accounting and not of sales distribution and we want to confine our

questions strictly to the setting of sales volume, the establishment of salesmen's quotas, the establishment of budgets for sales expense and for advertising.

I. J. ISLEY (*Accountant, I. Julian Isley & Company, Syracuse, N. Y.*): After you have made your scientific study of sales analysis and you have determined that only seventy-five per cent of production capacity can be had, would you recommend then to take on subsidiary lines to take up that twenty-five per cent capacity in production in order to reduce the overhead?

MR. DICK: I am afraid I can't answer that question. When you are dealing with the subject of telling somebody he should take on new products, there are so many factors to be taken into consideration that I don't believe I could give a broad answer to such a question as that.

For instance, here is a concern that is running only seventy-five per cent and probably not making too much money. The real gravy comes when they get up to eighty-five or ninety per cent. And so the company says, "We have this excess capacity. Should we take on any other products to take up the slack?" Right away you have to know what kind of product that company could sell, as well as what kind it could make. Until that was determined, the advisability of taking on a product would have to remain an open question.

That is why I don't believe that I could possibly answer that question. There are too many factors that would enter into it before you could determine whether a company should or should not engage in another line of endeavor. I would certainly recommend they look into it and find out whether some product could well fit into both their manufacturing and marketing situation, so they wouldn't have to talk too new a language in getting after the business on the new product.

H. B. SPEYER (*Auditor, Champion Spark Plug Company, Toledo, Ohio*): Having established your sales quota, your budget, and selling through jobbers and direct as you do, is it not frequently the case that a jobber in one district will sell in another, upsetting your ability to find out exactly how your actual sales check against your budgeted sales in a specific territory?

For example, in Chicago where they have the large mail order houses, their great factor is in selling other sales territories. This substantially upsets any forecast of territorial worth. Is it possible to check those figures?

MR. DICK: Would you pardon me if I pass the question on to Mr. Knowland? It happens that the question of overlapping jobbers entered into their case.

MR. KNOWLAND: This question of determining what to do with the jobbers, which is a many-sided problem, is one of the most important and one of the most difficult to settle. It is true that in nearly any organization, a large part or a total of whose sales go through jobbers, there will be conflicts between various jobbers operating over the same part of the country. It so happens that through the middle west the jobbing situation is upset for nearly all of the very few lines of industry with which I am familiar. The competition there is very keen and there is a great deal of interference.

In our own case, we had to settle the situation in New England and we got around it by having only one jobber in the New England territory. And, of course, I am not saying that would be the thing for someone else to do; it was for us. We sell direct there and we have this one jobber. That system has been in use for only about six or eight months. It looks as though it were going to be very successful. We have also restricted the number of jobbers in order to avoid interference in the New York territory, about New York City, and also in Philadelphia. That seems to be the answer in our particular case. Obviously, it is a solution that must be thoroughly considered by any concern that is troubled with conflicting interests among their jobbing distributors.

Does that more or less answer the point?

MR. SPEYER: It doesn't pertain to our particular industry, the automotive parts industry, where it is necessary to have a great many outlets and they are constantly conflicting. I don't know what the answer is. I am trying to find out.

MR. KNOWLAND: Our solution in the case of anything so highly specialized as your product would not apply. It is some-

thing each concern has to study for itself. I guess there is no cut and dried answer.

R. J. LaVALLEE (*Auditor, Syntron Company, Pittsburgh, Pa.*): I would like to ask Mr. Dick a question concerning selling specialties direct to a consumer and also through jobbers, whether or not the discount should be budgeted against sales or whether it is more a direct charge against sales or a reduction in sales price.

MR. DICK: Do you refer to any special discounts given on occasion?

MR. LaVALLEE: No, not special discounts, but ordinary discounts which we make to jobbers. Would you consider that a sales expense in lieu of the expense we go to ordinarily in selling direct to the consumer?

MR. DICK: As a matter of operating control and purely from a supplemental record standpoint, it is all right for the management of the business to know that. Actually, it is not good practice nor is it common to do that. It is, though, of value from an operating standpoint to say, "Here is what it costs us to sell", whether we give it to a salesman or give it to one of our jobbers.

They are just as much a part of our organization as though they were on our pay roll full time. We have to allow a twenty per cent markup to get our goods sold. But as I say, that is from a control standpoint and a supplemental record standpoint, as I see it, rather than a primary record standpoint.

MR. LaVALLEE: I would like to ask Mr. Christie whether or not the 1931 prices of his products, in which he maintained the sales volume, were higher, lower, or the same as for 1930?

MR. CHRISTIE: Our prices today are slightly higher than they were last year.

MR. JAMES: That is a good answer all right. I told him he didn't have to answer it if he didn't want to.

D. RICHARDSON (*Assistant Secretary and Assistant Treas-*

*urer, Monroe Calculating Machine Company, Orange, N. J.*): I would like to ask Mr. Dick, if, in the case of an organization selling directly through their own salesmen, he would set the quotas or budgets for the various sales offices entirely in his home office, with the Statistical and Sales Departments working together, or would he take into consideration the viewpoints of the individual salesmen by asking their advice of the potentialities of their local territories?

MR. DICK: By all means I would take the sales force into the picture, from the standpoint of just enlisting their interest if for no other reason. In the first place, they are closer to the picture out there than you can ever be, and while you may keep your fingers crossed mentally when you listen to what they tell you, actually their viewpoints are very helpful.

When the quotas are finally given out to them you can say to the force; "We all played a part. We listened to your story and we listened to the other fellow's and we made some pretty clear analysis, and here are your quotas". And even if you have finally shuffled the salesman's figures out of the picture entirely, he feels pretty good that he has been a part of it.

MR. RICHARDSON: When the organization is made up of salesmen controlled by district managers and further controlled by division managers, would you not deem it advisable to have the salesman make up his figures, submit them to the district manager, and through his better judgment go over them and then refer them to the division manager before they go into the home office? As you know, salesmen as a rule are optimistic.

MR. DICK: As a matter of fact, I saw that done last year by one of our clients, a very large organization with about 2500 people in the field. They worked it up step by step that way. It took several months to do it. It was all boiled out through the district offices and in turn the branch and warehouse headquarters, for the general manager of that district was really the general manager of the business, in a sense. It finally got up to the director of sales and the president of the company and they gave it the once over.

In the meantime, the Sales Department had been working on

potentials and making that type of analysis for months while these other fellows were making their recommendations from the field standpoint. I saw exactly that thing done and it seemed to be effectual. I have always felt it was a very sensible thing for them to do.

F. W. KNIGHT (*Cost Accountant, Macbeth-Evans Glass Company, Charleroi, Pa.*): My question was partly answered just now. However, I might say further that never having previously set budgets for our individual salesmen, we have started out by giving them comparisons or monthly checkups with their own individual, unadjusted estimates for this year, and at the end of this six months, beginning July 1st, we want to give them a monthly checkup with their own revised estimates for this year submitted by them after seeing what they have done for the first five months. I personally believe that this will be a good start in training our salesmen to think along this line of budgeting, and then later we can adjust their estimates with our own figures, using all available statistics to make their budgets more scientific.

MR. JAMES: Then you are supporting the very proposition that has been made.

GORDON S. BATTELLE (*Partner, Battelle & Battelle, Dayton, Ohio*): May I ask Mr. Dick at what point, when he makes the analysis of the individual customer, he determines whether an account is profitable or whether it is unprofitable to such an extent that he should keep the salesman away from it.

MR. DICK: As I understand the question, Mr. Battelle wants to know at what point the profitableness of the account is determined as a matter of sales control and supervision. Is that correct?

MR. BATTELLE: Yes.

MR. DICK: I don't know that I can say at what point it is done. The information gathered through the Sales Department or the Accounting Department, or both, ought to be constantly available. I don't believe in this thing of making a study once a year and then letting it go until you think to do it again, because conditions are constantly changing.

You may know what it costs, and in a well ordered Sales Department they do know what it costs, for a man to make a call; you may know your operation costs, the gross market for your goods, and the economic size limit of a particular account, but to say at what particular point you should determine its profitableness, forces the answer that it should be done constantly, and I think it often should be done with the aid of the Accounting Department.

MR. JAMES: As I understand the question, in saying at what point he means at what volume of potential business from a particular customer do you think it worth while going after him or passing him up.

MR. BATTELLE: That would depend on the individual company, but here is a salesman, for example, who has 125 customers regularly. We find that our study shows that perhaps fifty of these customers are not profitable. What would we better do under those circumstances, re-vamp that salesman's territory and let him stay away from these fifty small customers, or let him spend most of his time with the larger customers? Just what would you suggest as the better policy?

MR. DICK: Well, that reminds me of the question of the economical size of orders. You should always determine what you can afford to go after at any one time. And that decision may be very different at different times.

We told you that in this Naca situation some thought was given to abandoning outside territory that was difficult to cultivate properly. You get a very much colored picture as to the value of that outside business from the standpoint of absorbing overhead, but perhaps the company is comfortably busy without it. It seems to me the same principle applies where you analyze the account from the standpoint of its economic advisability. If you want the business, if you need it for factory overhead absorption, maybe you won't make the same type of meticulous analysis you would under a different set of circumstances.

MR. JAMES: I think now you have a very definite answer to his question.

EMORY AUSTIN (*General Auditor, Hammermill Paper Com-*

*pany, Erie, Pa.*): I would like to ask Mr. Dick if it is his recommendation, particularly as it is applicable to the Naca Company, that the sales quota and the sales forecast or budget of sales volume be set at the same figure?

MR. DICK: You mean that the sum total of the individual quotas should exactly correspond to the major sales quota?

MR. AUSTIN: Some companies may set their sales quotas higher than their sales budgets, for inspirational purposes.

MR. DICK: That was not done in this case. They are one and the same figures.

MR. AUSTIN: Was that point brought out in the discussion?

MR. DICK: No. Actually that is a business budget and the inspirational feature is not in that quota. We deliberately kept it out in this case.

MR. AUSTIN: The point, as I see it, is this. You have your sales quota and if you fool around with that as your budget, you are going to get into deep water when you start working on your production side. You have to be very careful to have your stimulant to the Sales Department and yet, particularly at a time like this when you are talking production schedules and reductions and curtailment of expenses, not get too much of the inspirational applied to the expenditure of funds in the plant.

MR. DICK: That was why it was entirely eliminated in this particular case. No consideration whatsoever was given to that.

MR. KNOWLAND: I should like to say that your production part of the budget must be kept entirely separate from your sales. In the beginning, when you get out the budget, regard them as being the same, and they are the same so far as figuring goes. So far as the absorption of cost goes, you have to use that basis, but no company can afford to carry more than a certain amount of goods, either process inventory or finished goods inventory. You cannot build up inventory above what your finances will afford, what your

sales demands are, or what the directors incidentally might let you.

The result is that when you are actually applying the budget system to production, the thing you steer your production by is the rate of sales, and that must be entirely without recourse to overhead absorption or anything else. It is how many goods you have in inventory, what is your rate of sales, and how fast you need to manufacture to keep the normal inventory in a condition to meet your current sales that should control; and if on that basis your production budget and your sales budget are not lived up to, you are just out of luck,—yet that is the only way to operate.

MR. JAMES: I am sorry the time is up but we are supposed to adjourn at four-thirty and I have one announcement to make.

## ADJOURNMENT

# SESSIONS V AND VI

# THE ESTABLISHMENT OF CONTROL THROUGH THE BUDGET

THURSDAY MORNING AND AFTERNOON

JUNE 18, 1931

ROBERT E. WARREN was graduated from Ohio Wesleyan University in 1915. Following two years of accounting and office work, he entered the Army and was a second lieutenant in the air service during the war. He received a C.P.A. certificate in Ohio in 1923 having entered the public accounting field in 1919. Since 1923 he has been affiliated with the firm of Lybrand, Ross Brothers & Montgomery in their Cleveland office, of which he is now manager. He has been a member of our Association for several years and is the president of the Cleveland chapter of the Ohio Society of Certified Public Accountants.

EDMUND S. LA ROSE followed his military school training by work in mechanical engineering and the first years of his industrial experience were in that field. In 1915 to 1926 he engaged in mechanical and industrial engineering work in both private and public capacity. Since that time he has been the assistant comptroller of Bausch and Lomb Company of Rochester. He is past president of our Rochester Chapter and was elected a member of our national board of directors at the 1931 convention. He is a member of a number of other accounting associations and organizations, and during the past two years he has addressed a large number of our chapters. He is the author of several articles on accounting and budgetary control appearing in numerous business magazines.

C. H. CROCKER is a certified public accountant of New Hampshire but has had a wide experience in both public and private accounting work. He was vice president and comptroller for several years of a large export and shipping organization and treasurer and comptroller of a motor truck manufacturing company. He also organized and was treasurer of a motor finance company, and he was accountant and systematizer for one of the largest anthracite producers in the United States. At the present time he is comptroller of the Worthington Pump & Machinery Corp. Mr. Crocker has been active in our New York Chapter for the past two years.

GEORGE M. ARISMAN followed his industrial engineering work at Penn State College with accounting training at the La Salle Extension University. Since his graduation from college he has been with the Armstrong Cork Company at Lancaster, Pa. At the present time he is the assistant comptroller of that organization. His work there has been of a varied nature in both the engineering and accounting phases of the company's business.

# THE ESTABLISHMENT OF CONTROL THROUGH THE BUDGET

PRESIDENT COLLINS: We are now ready to re-open the meeting of the board of directors of the Naca Manufacturing Company and to resume this study of the problem President James has to bring this company back on its feet. The way this has been going the last couple of days, I am sure it is coming back and coming back fast, and after you hear this morning's program you are going to feel that same way, because there is going to be a lot of fire in it. We started off with a fire and I think we are going to wind up with a big fire.

So now, if Mr. James will step to the platform, we shall continue our technical program.

MR. JAMES: To get to the serious part of the consideration of the further development of the plan of the reorganization of the Naca Manufacturing Company, we have with us this morning our controller, Mr. Robert Warren. Mr. Warren was graduated from Ohio Wesleyan University, I think about 1915, and for a time he was an ordinary accountant like some other folks I know. After the war he entered public accounting and until we persuaded him to take the job of controller of the Naca Manufacturing Company, he was in charge of the Cleveland Office of Lybrand, Ross Brothers & Montgomery.

Mr. Warren has handed out to each one of you a set of the journal entries that are needed to record standard costs in their simplest form. He will go through those rather rapidly. He won't have as long as we really ought to give him so he will have to be rather brief.

I will now ask Mr. Warren to undertake to describe the bookkeeping procedure by which the Naca Manufacturing Company is going to record these facts for the purpose of analyzing them, and of presenting them in statement form for the benefit of the foreman, the superintendent, the manager and myself.

# THE ACCOUNTING PHASES OF THE REORGANIZATION PLAN

ROBERT E. WARREN

Cleveland Manager, Lybrand, Ross Brothers & Montgomery

A BUSINESS organization is an army. The military organization in any particular engagement has for its purpose the winning of an objective. The business organization has for its purpose the winning of profits. The enemies which it has to overcome to gain this objective are inefficiency, waste, excessive overhead and ruinous competition.

In the military organization there are two types of officers: staff and line. The staff officers are responsible for providing supplies, ammunition and transportation for the army and for the major plans of strategy, including attack, retreat and general movements by means of which the objective is to be attained. The line officers are responsible for putting the plans into effect and for keeping the staff informed as to progress of advances and retreats and movements of the enemy which tend to retard or assist in the achievement of the objective. Obviously this divergence of responsibilities brings about a divergence of viewpoints. The staff is interested in final results; the line officers in the success or failure of the attack of their own units. In spite of this divergence of viewpoints coordination is essential or defeat is inevitable. Only failure can reward a campaign in which the staff is not fully advised of enemy movements, the condition of the terrain and the success or failure of each major unit taking part.

The same situation exists in business. In the case of the Naca Manufacturing Company, the directors and administrative officers, are the staff. The cost accountants, sales manager, production manager and supervisors are the line of officers. The directors are charged with providing the sinews of war—capital and credit—and with passing upon the major plans intended to obtain the objective of net profits realized. Our line officers—the factory and sales executives—are charged with the duty of carrying out these plans —of utilizing the capital and credit provided in order to overcome our enemies, inefficiency, waste and competition and attain the objective of profit.

The Accounting Department is the intelligence service in this

army. It must keep the operating management and the staff currently informed of all developments and of the progress that is being made in the struggle for the objective.

In the past, much criticism has been levelled at the Accounting Department. Part of it was deserved—part of it was unjust. Heretofore our Accounting Department produced only history. Our statements revealed whether past activities produced profits or losses but they failed to indicate the specific causes contributing to these results.

Review the situation with which our president has been faced. Heretofore we have compiled a budget for each month. That budget was based on estimated sales and on what our production costs had been in preceding months. At the end of the month the Accounting Department prepared a statement of actual results and submitted it to Mr. James together with a comparison of this statement with the budget.

To what end? When sales volume showed a decline, the sales manager was loudly berated and the individual salesmen were treated to a series of "pep" talks and stimulating correspondence. When the percentage of sales costs to sales increased, the production manager came in for a bad half-hour. But on the whole, and except in rare instances, there was no information available upon which to predicate a constructive course of action. Attempts in this direction generally resulted in the conclusion that something was wrong with the Accounting Department and that the controller was ineffective, inefficient and unnecessary.

I did not enjoy the role. No one in the Accounting Department enjoyed saying "I do not know" when Mr. James sought a definite answer to his eternal question, "Where are the profits going?" And because the Accounting Department did not enjoy that situation, I am more than happy to have the privilege of coming before you to urge the adoption of the suggested plan of standard costs. For with that plan in force the Accounting Department will become a vital force in the management of the business.

In the past the Accounting Department has recorded only history. Under the suggested plans, we will record these pertinent facts:

1. Standards or the measure of our accomplishments;
2. Actual accomplishments; and

3. Variances or the margin between standards and accomplishments.

And of these three, the last—or variances—is the most important from the viewpoint of the management. In that one word "variance" is found the answer to Mr. James' question: "What has become of the profits?"

Mr. Reitell has stated that the variances are as follows:

Sales variances:
1. Price
2. Volume
3. Expense

Administration:
4. Expense

Factory variance:
5. Material price
6. Material yield
7. Labor fall downs and make outs
8. Extra allowance
9. Rates of pay
10. Volume variance
11. Controllable or efficiency variance
12. Profit or loss variances

Let us see how these variances will be recorded in the accounts. Each of you, I believe, has been supplied with a set of illustrative journal entries number one to nine inclusive. These entries are intended merely as illustrations of how the various factors upon which variances are determined may be recorded in the books of account. They are not submitted either as models or as a complete outline of the accounting procedure involved. They illustrate principles, not applications of the principles. (See pages 188 and 189.)

First, then, we will include in our chart of accounts an account for each of the variances which our Cost Accounting Department has advised us we can expect. Assuming, for instance, that the variance group will bear the key number "100", then sales price variance will be "100.1"; sales volume variance will be "100.2" and so on. These accounts, of course, can be in more or less detail as the plan develops. Thus, for instance, sales expense may be covered by a series of accounts—one for each type of sales expense. It is impossible in the time available to outline and discuss in detail

the accounting system and procedure which will be followed if you authorize the plan.

Having established these accounts the next thing to determine is how the essential facts are recorded in them. The first journal entry illustrates how material price variance is entered.

You will recall that on Tuesday morning, Mr. Reitell explained that part of the excessive costs of ¾" x 8" bolts was due, in part, to an increase in the cost of material resulting from a purchase of ten tons of rods at warehouse prices. With our present system, only the diligence of Mr. Reitell brought that fact to light. With the suggested plan in force, it would be automatically and clearly noted. Referring to entry number one, you will note that we charge stores inventory with purchases at standard prices for the quantity and grade of material purchased. Accounts payable is credited with the actual cost and the difference charged or credited to material price variance. In the case of the purchase of steel rods referred to by Mr. Reitell, there was an excess of actual over standard and the entry would therefore be a debit to material price variance. Hence the material price variance account shows at all times how actual prices compare with standard. A debit balance in the account indicates that actual is above standard whereas the opposite is true if the balance is a credit.

Next we come to the treatment of overhead expense, including indirect labor, and direct labor. Taking overhead expense you will note that by journal entries two and three, this account is charged with actual expenses incurred and accrued, with standard cost of supplies consumed and with the actual indirect labor payroll. At this point overhead expenses represent actual expenses plus supplies at standard costs. Variance in price of supplies is automatically taken care of by journal entry one. Therefore, for the purpose of comparing actual overhead with standard, the overhead expenses after journal entries two and three may be said to represent actual overhead for the period. This overhead, as has already been pointed out and explained in detail, consists of two types of expense, fixed and controllable. Fixed expenses are beyond the control of the operating department heads. No matter how efficient the plant and personnel, these expenses remain the same. The ratio varies only with volume.

As shown by journal entry four, work-in-process inventory is charged with standard overhead expense applicable to actual pro-

duction. The difference between this standard overhead, absorbed by actual production, and the shop overhead allowance for the period is volume variance and is charged or credited to the volume variance account. Having cleared fixed overhead expense of the standard shop allowance, we have a balance left in the overhead expense account. This balance may be a debit or credit. What does it represent?

Remember, overhead expense was charged with actual overhead by journal entries two and three. It was credited with the standard shop allowance for the period. Therefore, the balance must be the amount by which actual overhead differed from the standard allowance. This difference, or the balance in the overhead expense account, is controllable variance and is so charged as illustrated by journal entry five.

Our next step is to clear the direct labor account which was charged with actual direct payroll by journal entry three. The amount of this actual direct labor payroll is credited to the account, as shown in journal entry six; work-in-process inventory is charged with direct labor at standard rates and the difference, if any, is charged or credited, as the case may be, to direct labor variance. This variance account shows the amount by which actual labor costs exceeded standard. Of course, in actual practice, this direct labor variance will be so recorded that the amount due to the various causes such as rates of pay, fall downs and take outs, etc., can be properly allocated.

But one other type of variance remains to be accounted for—namely, material quantity usage. Journal entry seven illustrates the method of handling that very important item. As shown by the illustrative entry — number seven — work-in-process inventory is charged with materials at standard prices and standard quantities. Stores, on the other hand, is credited with standard price for material actually consumed. The difference between the quantity actually consumed and the standard is charged or credited to material quantity variance. Therefore, the balance in this account represents the variance between actual and standard material consumption.

It now remains but to clear work-in-process to finished goods and then to cost of sales. The entries for these processes are illustrated by journal entries eight and nine, which certainly need no explanation.

And here I want to state that I hope no one will ask any one of a number of questions that to my mind are entirely academic. They have to do with whether inventory should be stated at cost or standard; whether it is preferable to record standards in the general accounts or in independent statistical records; and whether, in the final statement, variances should be shown as part of costs or as separate deductions from operating profits. I have found in my inspection of a large number of systems that the number of methods of treating these questions varies almost in direct ratio with the individuals who handle them. It seems to me that accountants must cease arguing about technicalities and get down to principles.

The principle involved is that the plan of management by standards is the next logical step for industry. When that plan is adopted, the details can be worked out in the manner most satisfactory in view of all the attendant circumstances.

Frankly, I feel I owe you an apology. What I have had to say has been, it seems to me, dangerously like a lesson in bookkeeping. I am sure it was tedious and tiresome. Indeed I am certain there are many of you much better qualified than I to give the lesson. Unfortunately, however, I am in life and in the Naca Manufacturing Company only the accountant. I am doomed by Providence and the casting director to a role which is far short of the heroic. The accountant should be as devoid of glamour as his records are of errors. Some executives may have the bosses' secretary arranging interviews for them, but the accountant is more often invited by his fellows to consult with his Satanic Majesty at the latter's summer home.

But all that is changing. Standards in management mean better days for industry and the controller and accountant as well. Later today you will have an opportunity to see how, with standard costs and budgetary control the accountant becomes strategist as well as historian. You will see how these accounts which I have outlined are translated into statements upon which business strategy is based. Then the Accounting Department becomes an active force in management. It is, to revert to our military comparison, the eyes of the business army. No plan will be formulated without its approval, no policy conceived without its consideration. If for no other reason than the selfish one of widening the scope of our activities and increasing our importance in the industrial organi-

zation, we accountants should be the first to accept and promote standards of management.

## Pro-Forma Journal Entries

Setting up and Disposing of Variances from Standards

1. Stores Inventory (Standard)
   *Material Price Variance
   Accounts Payable
   To charge stores inventory with raw materials and supplies at standard cost taking up the difference between standard and actual cost as material price variance.
2. Overhead Expenses (Actual)
   Accounts Payable
   Stores (Standard)
   Various Reserves
   To charge overhead expenses with audited vouchers, indirect material and supplies, and current accruals.
3. Direct Labor (Actual)
   Overhead Expenses (Indirect Labor, Actual)
   Payroll
   To record distribution of payroll.
4. Work in Process Inventory (Standard)
   *Volume Variance
   Overhead Expenses
   To charge work-in-process inventory with overhead applicable to actual production at standard rate, taking up the difference between the total amount thereby cleared to cost and the current budgeted overhead allowance as volume variance.
5. *Controllable Variance
   *Overhead Expenses
   To take up the difference between actual expenditures for overhead and the budgeted overhead allowances as controllable variance. Controllable variance is the difference between the standard

*These entries may be either debits or credits.

shop allowance for actual production and the actual overhead expenses incurred.

6. Work-in-Process Inventory (Standard)
   *Direct Labor Variance
   Direct Labor (Actual)
   To charge work-in-process inventory with the standard cost of direct labor, taking up the difference between standard and actual cost as direct labor variance, which is subject to segregation to show separately—
   Fall downs or make outs (workers' efficiency)
   Extra allowances
   Rates of Pay
7. Work-in-Process Inventory (Standard)
   *Material Quantity Variances
   Stores (Standard)
   To charge work-in-process inventory with the standard cost of raw materials, taking up the difference between the standard quantity and the actual quantity used in the material quantity variance.
8. Finished Goods Inventory (Standard)
   Work-In-Process Inventory (Standard)
   To transfer the cost of finished units at standard cost to finished goods inventory.
9. Cost of Sales (standard)
   Finished Goods Inventory (Standard)
   To transfer the cost of units sold at standard cost.

*These entries may be either debits or credits.

MR. JAMES: I think it was very gracious of Mr. Warren to sacrifice a considerable part of his time for the benefit of our next speaker. After all is said and done, we really ought to be able to handle our bookkeeping, and still there were questions from the floor the other day that indicated a desire, on the part of some of the board at least, to know what the mechanics of this accounting really were under a standard cost plan. For that reason, Mr. Warren has very briefly outlined them to you.

Now, the next man we are going to hear from is Ed La Rose. I don't think he needs any introduction, but I do want to tell you a little bit of my own personal appreciation of Ed's remarkable

versatility, and in order that you may know just how he got to be as good as he is, I want to tell you that he started out as an engineer. That is just a little bit of reflection, I believe, on the accounting profession. I haven't heard of an accountant who graduated into an engineer, but during the war we developed what we called cost engineers, men who straddled over from a practical knowledge of planning and execution into a measuring of results.

Now, Ed is just that. He is a graduate engineer. He started out in his education in a military way. He went to military school but it didn't "take" very seriously, because in spite of the fact that he is so big and handsome, the United States Government disposed of him in another fashion than shooting him into the trenches during the world war. They gave him an opportunity to help develop air craft and he spent some very profitable years on that for the benefit of the American forces.

He did industrial engineering work on his own hook for a while. In other words, he was the same type of engineer that Mr. Gerofski is, so you must know that Ed is a thoroughly practical man.

He has been assistant controller for the Bausch & Lomb Optical Company for the past six years. I have been up there, have gone over his stuff and either he is the cleverest figure juggler in the world or else he has been able to plan and execute a definite program built upon standards which is the proof of the pudding, the proof of the value of all of this standard cost plan that I am undertaking to sell to you on the strength of the advice of my cost accountant and these other individuals who have advocated it here.

Ed is more than that. He is the type of broad-gauged business man who is never content to dig himself into any situation and merely saw wood. He is always broadening his own horizon. He belongs to more organizations and gives more time to helping other folks than is conceivable for a business man to do. And yet I can't help but believe that much of his breadth of vision comes from that very fact, that "in giving he gets".

# ESTABLISHING CONTROL THROUGH THE BUDGET

E. S. LaRose

Assistant Controller

Bausch & Lomb Optical Company, Rochester, N. Y.

I CAN assure you that our company feels highly complimented upon being asked to appear before theNaca board of directors. If we can contribute any practical media which might possibly be of help to you in solving your problem, and I know it is a serious one, we are going to be very happy.

The basic principles of business should practically apply in almost every case. However, in order to attempt to prevent you from going out of this room today and saying, "But we can't apply this to our business on account of complications, different conditions, etc.", I would like to use several minutes in telling you a little bit about our company and its set-up.

The company had its inception in 1853 and manufactures optical glass, mountings and lenses, eye glass and spectacle frames, ophthalmic and scientific instruments, military instruments, such as range finders, periscopes, binoculars, etc., and many other products, which, in all, present a very wide and varied scope of problems.

The last of the first generation to participate in the operation of the business was Mr. J. J. Bausch, who died on February 14, 1926 at the age of ninety-six. The second generation, now between the ages of seventy and eighty, are still strong and active officers but gave over the actual operation of the business to the third generation in 1925.

Prior to the war, the company operated very successfully on a normal basis. They then enjoyed a greater or unusual volume and earnings during the war period, as a result of being immediately forced by the Allied and U. S. governments to enter into meeting the needs for the Army and Navy. Their products were virtually the eyes of the Army and Navy but the capacity of the company's facilities was entirely too small. First, they were confronted with only a two year's supply of imported optical glass, on hand in 1914. Immediately, both the U. S. government and the company co-or-

dinated on a night and day basis in making every effort towards the development of optical glass-making. Clay pot making, glass and glass pressing plants were constructed and today the company is the only optical manufacturer in the United States which produces optical glass. Second, in order to have immediate priority on instrument castings, a foundry was also constructed. Third, in order to increase operating facilities, an entire additional city block was acquired. This area contained approximately thirty-two dwellings which were removed to allow the construction of modern industrial buildings to house additional manufacturing equipment and facilities.

As a result of meeting the war demands, which practically absorbed the complete use of the optical facilities, the company then faced a tremendously large or excess capacity burden for post-war operation. Also, during the war, additional competition had set in, which heretofore had been practically negligible. Although war contracts continued and aided operation through 1920, the operations of the business thereafter, or from 1920 through 1926, caused a serious problem.

When the younger or third generation were officially given the operating reins of the business in 1925, they immediately realized that the adoption of modern methods of control were vitally essential if the post-war business was to be carried on profitably. In 1926 a thorough study was made of the capacity of the facilities, and their various uses, for the purpose of determining the necessary volume required to break even. It might be mentioned that there are today many managers in industry who continue to operate in the dark without knowing their "break-even" point. This study clearly indicated that a volume, much beyond the company's normal sales, which had been on an almost level line for six years (1921 through 1926), was necessary. It also showed that the company should rent one of its large buildings, 200′ x 200′, six floors, even though such a move might possibly hurt its pride. Again, and most outstanding, was the need for modern controls and goals for sales, costs, expenses and other items which finally determine and gauge the results of performance or net profit.

The building was rented. In the month of December, 1926, a complete sales analysis layout was made to be adapted to tabulating machines, which were put into operation in January, 1927. This sales layout covered sales by class of product, in both dollars and

units, by states, by district, by customer, by trades and many other classifications which will be referred to later.

Before continuing, I think it would be well to tell you that, in our own case, we removed the Sales Research and Sales Statistical Divisions from the Sales Department to the Controller's Division. Upon completion of the tabulated facts in the Tabulating Department, they were then thoroughly interpreted by the Sales Research Department and finally handed to the Sales Department on a platter and in a well interpreted basis. This change gave our Sales Department their full time for selling and has worked very successfully. Incidentally, the centralization and moving of the Sales Research and Statistical Departments reduced the expenses of those departments by approximately sixty per cent.

It was then decided that, in order to operate the plant and facilities both successfully and in a well-balanced manner, the management should create, adopt and use a master budgetary control system to cover the entire business. It is believed that there probably has been no phase of business organization and management, which has offered greater possibilities of control and operation than the introduction and use of budgetary control. The rapidly changing business conditions of today necessitate the use of scientifically prepared forecasts, and the nearest approximation to this medium or ideal is probably the budget.

In the development of a budget plan, it is not a case of simply waving a wand and, "bingo", the system is in. It takes a lot of time, planning and effort to make it successful.

As an example, it might be mentioned that it took the government over twelve years to get going on a budget plan. The government has a relatively easier task because they practically budget revenues to meet expenditures, while we, in industry, budget expenditures to meet revenues. The government started their budget task in December, 1909, when President Taft appropriated $100,000 for a commission to investigate the advantages or disadvantages of a budget system. In September, 1910, the commission was appointed and in June, 1912, they reported a need for a national budget. Then, in June, 1913, the commission went out of existence because the system was pigeon-holed by Congress who didn't want to be checked.

In 1916, the platforms of all parties recommended a budget, due to the demand of the public. In 1921, the budget became a law

and on December 5, 1921, the budget was sent to Congress by President Harding for the fiscal year ended June 20, 1923. Twelve years to get under way!

Industry followed in 1920 as they were no doubt confronted with post-war disaster and began to realize that they needed something better in the way of controls. They didn't want ancient history but they wanted some predetermined facts and goals to shoot at. So industry began to replace the historical records with standards and then followed by using all of those standards in the development of a budget system.

One of the books published by the National Industrial Conference Board in March of this year, "Budgetary Control in Manufacturing",[1] didn't exactly tell you how to set up a budget, but it did give the results of a year's research, covering the various adoptions and uses of a budget by 298 corporations listed by the census bureau as having a volume in excess of $100,000,000. There were only 162 out of these 298 corporations which used any part of a budget control, such as for sales, production, expenses, etc. Out of these 162, there were only thirty-three of such corporations in the United States who have adopted and used a complete budget system. Therefore, it is evident that a very fertile field remains for the development of budgets.

More important to accountants is the fact that, out of the ninety-three men listed, in this report, as being responsible for the budgets, fifty-nine or 63.5 per cent were controllers and seven were presidents. Therefore, the job is open to you. It is up to you to train yourself to take this opportunity and become the super-controllers in industry. When you work your way into it, you will find that there is no finer or better way of getting closer to the management than with your budget system. You will find that they will be calling you continually to assist in guiding them. Consequently, at least half of your time will be in the offices and with the executives of your company.

Mr. Dick brought out a point yesterday afternoon when he said that he believed that accountants had done a real job in the reduction of production costs and he couldn't understand why they had not gone into a study of distribution, distribution costs, markets and their relative buying powers, and other analysis work

[1] "Budgetary Control in Manufacturing"—Natinal Industrial Conference Board, New York, 1931.

pertaining to sales. After all, no matter what you do in the way of reducing operating costs, a business cannot exist without sales. He also believed that, as a result of his professional contacts, the accountant was the type of straight line thinker well-qualified for such sales work. A complete budget system is only as good as the *accuracy* of the sales forecast and its subsequent *flexible* ability to adjust itself to an increase or decrease in actual sales volume.

I do not believe that the budet is management itself. It is merely a most valuable contributing tool for management's use which must be superimposed by good management. It is evident that good management was applied with the budget in our business, for the reason that the level six year line of sales, as previously mentioned, showed a sudden upward turn or an increase of approximately fifty per cent during a three year period, 1927 through 1929. Profits were made in 1927 and subsequently doubled and quadrupled, 1930 being the best year we ever had, with the exception of 1929.

This morning, rather than give you a general or theoretical talk, an attempt will be made to tell you in an extemporaneous manner and as practically as possible, how we actually adopted a budget plan in 1927 and how, in a gradual manner, a complete master budget system has been developed and used.

Our problem, in developing both the sales and production budgets, not only in dollars but particularly by units, was rather an unusual and severe one, on account of the terrific variety of line of product. Not only myself, but particularly a great many other professional men who have been in our plant, including our auditors who are nationally and internationally known, have said that our inventory was one of the most comprehensive inventories of varieties that they had ever seen.

When it is realized that in the budgeting of sales, production and standard seasonal inventories of eyeglass lenses, we are dealing with a daily moving product consisting of over 40,000 varieties, and that in the manufacture of eyeglass frames, one frame can be made into one million combinations consisting of bridge styles, size, height and width; eye size; temple styles, ends and length; color, quality and weight of gold, etc., and that each item in the varied instrument line contains many detailed assembled parts, such as a medical microscope which has 300 parts and requires 3,250 distinct operations for its completion, and that in the building of military in-

struments, such as range finders, a time of some one to three years manufacturing period is involved, it is thoroughly believed that our control of both sales and production by units is unusual.

Also, the sales of practically all of the company's products have their own characteristic seasonal variations, which in some cases are extreme. In view of this seasonal sales condition, one of the outstanding problems of the company, to include and control by a budget plan, was that of attempting to stabilize production throughout the entire year in order to maintain or give constant employment to about three thousand employees. It was realized that stabilization of labor could only be accomplished through definite predetermined forecasts and planning. It might be mentioned that in reaching such a goal or obtaining stabilization, it was necessary for the company to augment its line through new products, invest in increased inventories in low seasons to be sold when peak seasons arrive, and, to carefully estimate its standard of labor performance.

For the purpose of cost and profit control, the entire variety of our products are segregated and classified into nineteen main product divisions. Nineteen monthly profit and loss statements are obtained to cover each one of these product divisions exclusive of the consolidated profit and loss statement, all of which are completed prior to the tenth of the month. It might also be mentioned that we segregate and create a monthly profit and loss statement for our foreign business by class of product.

When we started our budget we did not attempt to adopt any cut and dried system but did attempt to coordinate and use certain definite basic principles. At first our schedule of budget procedure was rather simple. However, it has now extended itself to at least twenty essential points, which I have attempted to summarize below under the heading "Highlights of Budgetary Procedure".

## "Highlights of Budgetary Procedure"

The facts which are essential for the proper preparation and resulting co-ordination of a budget plan, may be summarized as follows:

1. Study your normal business growth, using average monthly and secular trends.
2. Forecast general economic conditions a year in advance.

3. Find the deviation between your business and general business conditions.
4. Temper your growth, if necessary, with general business conditions.
5. Use a profitgraph to determine whether proposed or adjusted volume will create earnings desired.
6. Know your potential market by product, by district, by trading area.
7. Eliminate waste in distribution by concentration on profitable areas and products.
8. Beat depression by new products, advertising and increasing your goals in areas where potential is under-absorbed.
9. Know your seasonal trend of sales by products.
10. Develop a sales budget in both units and dollars by class of product, by month, by district, by trading area, by branch, by salesmen, by customer.
11. Develop a stabilized production plan by units, tempered by stock condition maintained to keep within sales estimates, so that labor may be employed constantly throughout the entire year.
12. Study capacity absorption and consequent overhead. Many times, knowledge of under absorbed overhead will cause a company to produce standard items for stock rather than suffer losses.
13. Forecast inventory increase or decrease from month to month on an annual basis, at all times attempting to set goals which will result in an increased turnover of both process and finished stock.
14. Establish standards of labor, tempered by most recent performance.
15. Carefully gauge materials, specifications, requirements, and purchases.
16. Control overhead in accordance with volume, segregated between fixed charges, staff required to maintain organization, semi-variables and variables.
17. Apply selling and advertising expenses, as nearly as possible, to gross profit available in each class of product in order to maintain the pre-determined goal of net profit.
18. Break down the profit and loss statement to product groups in order to find and study items possibly causing losses, in-

dicating the percentage of loss, the percentage contribution to total sales, and the percentage loss to total profit.

19. Prepare a cash budget in order to make provision of funds to meet prospective sales and production programs.
20. Provide for methods for checking, for flexibility and for revising standards according to performance.

Therefore, if you will bear with me, I hope to give you, in as complete and practical a manner as possible, the analysis and set-up involved for each point of budgetary procedure.

Pictures are known to convey messages in both a speedy and intelligent manner. For your benefit, a series of budget procedure charts and forms, which have been adapted to our set-up, will be presented by slides on the screen. I would like to take this opportunity to thank the men in the General Motors Photographic Department, General Motors Research Building, Detroit, Michigan, who, through Mr. J. Chas. O'Gorman, Secretary of our Detroit Chapter, co-operated and produced, in a manner of untiring effort and sincerity, the charts on slides. I believe that you will soon agree with me that the men and artists who did the work deserve the highest praise possible.

One more point that I would like to convey to you, is the fact that our original charts were re-drawn on a mythical basis, before being sent to Detroit, because it is not possible to disclose the figures of our company, which is a closed corporation. However, I am sure that the deviation base of one, two, three, four, etc., which has been used in many instances, can be readily converted by you into 10,000, 100,000, 1,000,000 or any volume you desire.

Figure one is used for studying the trend of monthly sales, monthly average sales, and the secular trend of growth. The line which breaks monthly indicates the total monthly sales and also a characteristic seasonal spring rise and a fall peak. Seasonal sales are caused by various reasons. In our case, we found, for instance, in the sale of lenses, that, inasmuch as the days become shorter and consequently duller in the fall, people find a need for glasses or for a change in their present glasses. Again, in the spring, when the days become longer and brighter, their eyes might again need attention although the spring season is not as great as the fall.

The line which breaks yearly shows the monthly average sales per year.

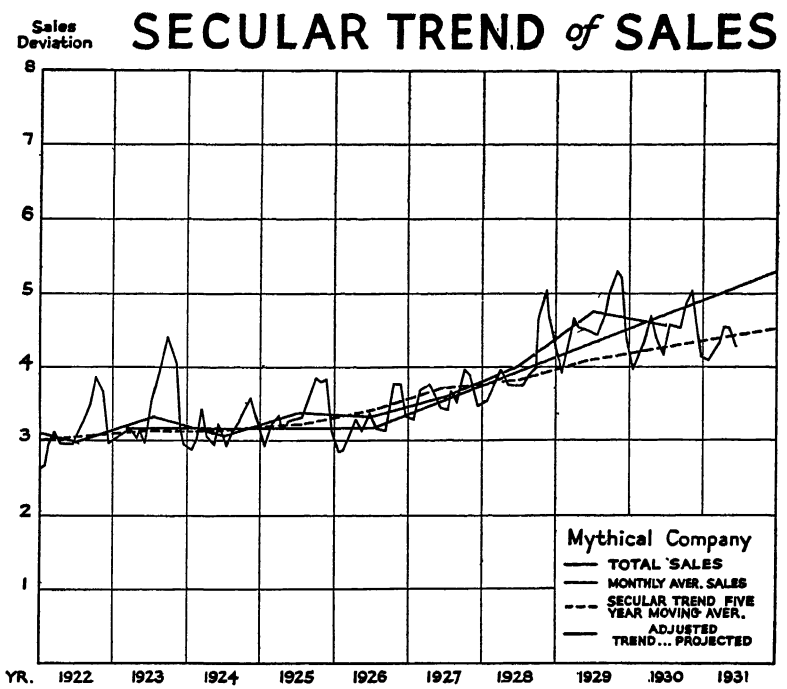


FIGURE 1

The secular trend or dotted line is the result of a five-year computed moving average. For instance, in the development of the secular trend of growth, you remove the sales figure for January of 1925 and add January of 1930, then remove February of 1925 and add February of 1930. The secular trend shows that the volume of the particular business being shown, was running along a level line through 1926 without any tendency of growth. You will later see where this steady volume of sales was insufficient to fully utilize the plant capacity and to make profits.

An adjusted secular trend of growth is indicated by the solid straight line above the dotted line. That is, the business picked up and turned so rapidly in 1927, 1928 and 1929, as shown by the mythical figures, that an adjustment to the projected trend of growth became necessary.

This chart is what we use for the presentation to our management of a picture of the past and possible future trends. For instance, on or about September 1, 1930, our general manager used

such a chart for determining what his normal trend of growth should be for the budget of 1931. I would also qualify this statement by saying that our management is now planning three years in advance, although in September, of the year previous, they arrive at their *exact* goal for the following year.

There probably isn't a business manager in the country who wants to stand still or fail to get his share in the growth of his particular line or of general business. You no doubt know, for instance, that the National Cash Register Company enjoyed a record of an average of ten per cent increase per year or 100 per cent average increase every ten years for fifty years. That, I believe, is an enviable record.

The management first takes the median or half year point, from the monthly projected secular trend of growth for the following year, and multiplies it by twelve. We will assume that that medium monthly point was approximately five (as shown by the chart) and when multiplied by twelve, told them, for instance, that the business for 1931 should be six hundred thousand, six million, sixty million or whatever you may care to use for yourself as the value of the deviation figure as shown on the side of the chart.

However, upon arriving at the desired growth or goal, there are other factors which enter into the picture. In this particular year, 1931, there were business conditions to be contended with which might cause volume adjustment or curtailment. Therefore, it now becomes necessary to temper the normal growth to business conditions. An attempt will be made to show you, in chart form, how we compare our business with general business conditions.

The solid line on figure two shows you the sales of the mythical company with seasonal variation and secular trend removed, expressed in average diviations. The general business index, as shown by the dotted line, is represented by the American Telephone and Telegraph index prior to January, 1927 and the Annalist index of general business activity after January, 1927.

The point which I wish to bring out here is the fact that this study proved to us that our business varied considerably, in deviation with general business. The curves show that, when business was low our business was lower and when business was good our business was higher. That condition indicates a tendency towards what is characterized as a luxury line of product. That is, people buy more than they need in good times and less than they need in

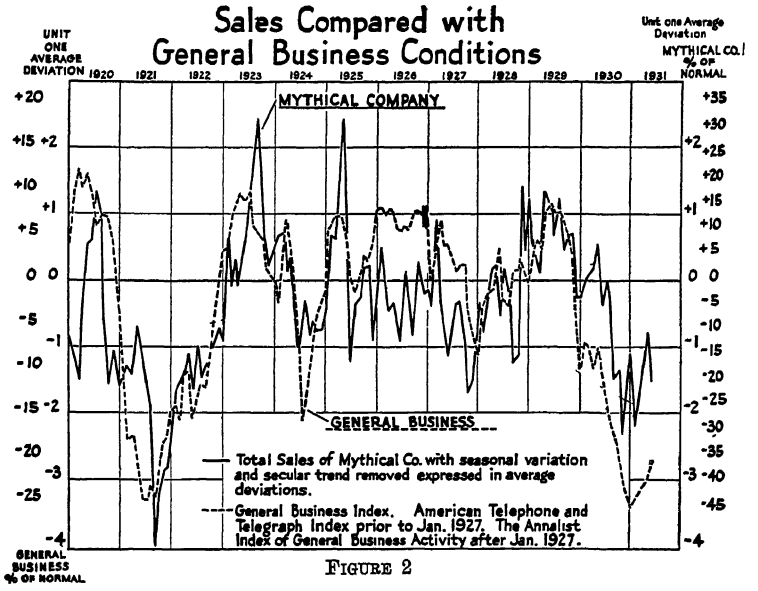


FIGURE 2

poor times. You all know what happened to the powder and perfume industry last year.

In using this chart, you will note that the low point of general business was in January, 1931, when it hit approximately twenty-five per cent below normal. Following the low in January, you will note a steady upward turn although, when I left Rochester, we were rather upset about the fact that the weekly line showed a tendency towards a drop in May. That is, we feel that we cannot wait until the monthly figures of general business are available and therefore try to get them out weekly.

Upon completing the study of the deviation of our business from general business conditions, we found that we were able to use an average deviation. That is, when business would be twenty per cent under normal, our business might possibly be thirty-five per cent under normal, and when business was fifteen per cent above normal, our business might be twenty-five per cent above normal. Therefore, with a forecast of your possible business, on the basis of your trend of growth, and with a forecase of general business conditions, you are then able to use the computed deviation figure in order to determine the effect of general business, which will be explained in the following chart.

However, before leaving this general business condition chart, I would like to tell you about one of the outstanding items which occurred in the preparation of our 1930 budget. We had started the work of preparing our 1930 budget in September of 1929 and you will no doubt all very well recall the break that followed in October of 1929. We had forecasted a drop in general business for 1930, and had completed the sales, cost of sales and gross profit

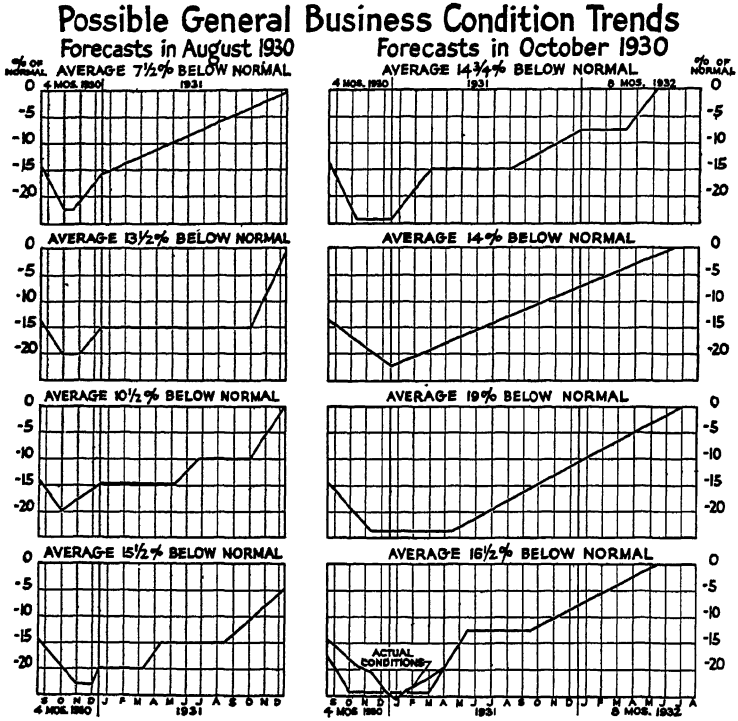


FIGURE 3

budget for 1930, when the October 1929 break occurred, which was greater than anticipated. However, we went to the management and stated our belief that the forecasted reduced cost of sales and consequent increase in gross profit should be used, for the first time in our history, as an appropriation for doubling our advertising expenditure, thereby combating the break in general business.

We doubled our advertising expenditure budget. You will note

from the chart that heretofore, while our business had practically gone up or down or nested with the general business curve, it did not drop in 1929 and kept right on going until approximately September 1930 or for about one year following the start of the depression. Incidentally, our courage was strong enough to pay us good rewards. Ordinarily, we should have gone down farther than the general business condition break of approximately twenty-five per cent. However, you will note that, while business continued to drop steadily beyond September 1930, we were again able to hold our own at this point of break, September 1930, and since that time we have been steadily pulling ourselves back again.

This example has been given to you for the reason that it is believed to be a very good picture of what forecasting and budgeting did for us, having, as we did, the statement of business conditions and a forecast of those conditions with which we were going to be confronted.

In preparing our 1931 budget, we attempted to get business condition forecasts from sources all over the country but they all varied considerably. Figure three shows how we attempted to handle the situation.

In September of 1930, a large majority were forecasting that business would be back to normal at the end of 1931. Everyone had different ideas as to how it would come back. Some said steadily, others abruptly and others on a varied line, while others, who were wise, would say nothing. On the left of the chart you will note the plotting of the various opinions as to how it would reach normal at the end of 1931.

Each forecast was measured and if the condition prevailed, as shown in the lower frame on the left side, we would know that the average business for the year would be 15.5 per cent below normal. As shown in the next frame above, it would be 10.5 per cent, and so on.

However, you all know that shortly after September, 1930, practically all of these nationally known opinions were changed and forecasts were then made that business would not reach normal until the middle of 1932. The forecasts in the frames at the right side of the chart indicate the opinions of the trend of "come-back" to the middle of 1932. The forecast in the lower right hand frame happens to be that of my own judgment which indicated that business would average 16.5 per cent below normal for the year of

1931. While we haven't hit it as accurately as we might, you can readily observe, from the "actual conditions" line, how we are hitting it so far.

Our management then applied the forecast of general business conditions of 16.5 per cent below normal for 1931, to our 1931 projected trend of growth and then made an adjustment for our deviation with general business conditions. Our condition had shown an improved deviation for both the years of 1929 and 1930. As an example, the normal growth of your business might have been indicated to be a volume of $20,000,000 for 1931. Adjusting this normal growth by the 16.5 per cent break in general business, a volume of $16,700,000 would be indicated and subsequently adjusted to perhaps $16,000,000 by deviation provision.

However, in our own case, our management found that they could not take the full business condition break. Therefore, it would be necessary for them to beat some of this business depression with new products and increased sales effort, or re-allocated sales effort in accordance with the potential market or buying power studies of the various districts and trading areas throughout the country. Our management was aware that they could not take this break, on the basis of the data which will be presented to you on the next chart.

However, before referring to this next chart, I would like to call your attention to the fact that on account of general business being forecasted to come back at an angle, or for instance, from twenty-five per cent below normal in January 1931 to ten per cent below normal in December 1931, the standard seasonal monthly trend of sales should possibly be tilted. That is, in the early months of the year, if you were formerly getting six per cent of your annual business in January, seven per cent in March and eight per cent in April, you would tilt this seasonal trend according to the way business was coming back. You would then find that perhaps you were only going to get four or five per cent in January and March, respectively, instead of six or seven per cent, in the early months of the year. In accordance with this adjustment, you would then increase your per cent seasonal absorption in the fall from perhaps twelve per cent of your total in October to fourteen per cent, when business would be better than your average, on account of the angular trend of come-back.

While this analysis of tilting the standard seasonal monthly

trend of the sales goal is rather theoretical, there is no question but that it is rather true. However, we did not want to tilt our monthly sales budget, as we believed it would give our salesmen a relatively easier task in the early part of the year and a much harder task in the latter months of the year. We were anxious to get all the business possible and not fail by having lowered seasonal goals in the early months of the year. However, we prepare a separate, single sheet report of our volume for the general manager, indicating our business performance related to general business conditions, giving the seasonal tilted effect to this report.

An example of this report would be as follows:

FIRST FIVE MONTHS—JANUARY THROUGH MAY 1931
ACCUMULATED

| | General Business | Bausch & Lomb (Inc. Deviation) | $ Below | $ Sales |
|---|---|---|---|---|
| (Normal Volume for 1931—$20,000,000) Standard Sales Absorption Jan. through May, 38.0% | ... | ... | ..... | 7,600,000 |
| *Adverse Factors* | | | | |
| 1. Budget Allowance (Year) | — 7.5 | —12.0 | —912,000 | 6,688,000 (Budget 1st 5 Months) |
| 2. Non-Tilted Seasonal All. | — 5.0 | — 8.0 | —608,000 | |
| Total Adj. Inc. Tilting | —12.5 | —20.0 | —1,520,000 | 6,080,000 Budget-Tilted (1st 5 Mos.) |
| 3. Further Decline since October, 1930 | —11.6 | —18.5 | —1,406,000 | |
| *Grand Total Effect* | —24.1 | —38.5 | —2,926,000 | 4,674,000 |

| | | |
|---|---|---|
| 4. Management Counteracted No. 3, Further Decline by | | |
| Actual Sales | | 6,061,800 |
| Budget Tilted | | 6,080,000 |
| Sales Within | — .3 | — 18,200 |
| Further Decline | | +1,406,000 |
| Results of Sales Effort, New Product, etc. Net Gain | | 1,387,800 |

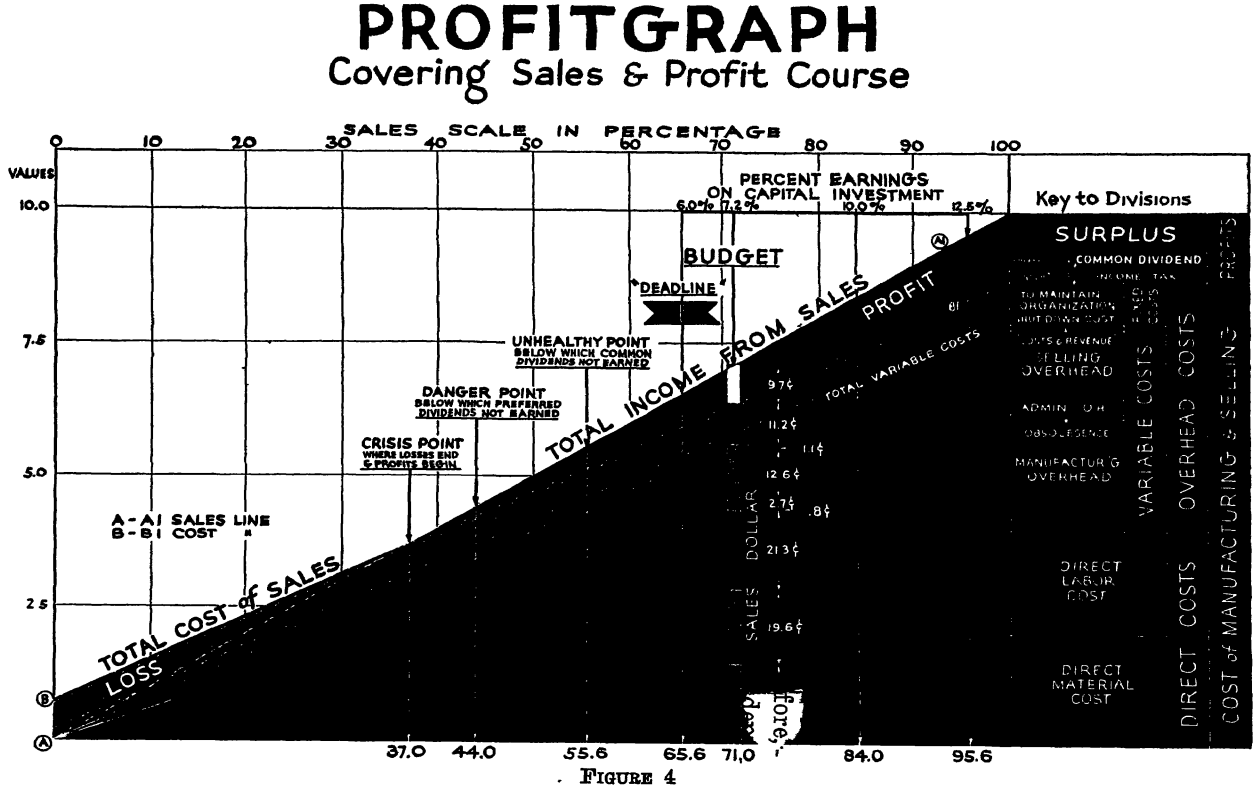
PROFITGRAPH
Covering Sales & Profit Course
SALES SCALE IN PERCENTAGE
0
10
20
30
40
50
60
70
80
90
100
VALUES
10.0
7.5
5.0
2.5
PERCENT EARNINGS ON CAPITAL INVESTMENT
6.0%
7.2%
10.0%
12.5%
Key to Divisions
SURPLUS
COMMON DIVIDEND
INCOME TAX
TO MAINTAIN ORGANIZATION
SHUT DOWN COST
PROFITS
SELLING OVERHEAD
ADMIN. O.H.
OBSOLESENCE
MANUFACTURING OVERHEAD
VARIABLE COSTS
OVERHEAD COSTS
DIRECT COSTS
COST of MANUFACTURING & SELLING
BUDGET
"DEADLINE"
UNHEALTHY POINT
BELOW WHICH COMMON DIVIDENDS NOT EARNED
DANGER POINT
BELOW WHICH PREFERRED DIVIDENDS NOT EARNED
CRISIS POINT
WHERE LOSSES END & PROFITS BEGIN.
TOTAL INCOME FROM SALES
PROFIT
TOTAL VARIABLE COSTS
TOTAL COST of SALES
LOSS
A-A1 SALES LINE
B-B1 COST "
SALES DOLLAR
9.7¢
11.2¢
11¢
12.6¢
2.7¢
.8¢
21.3¢
19.6¢
37.0
44.0
55.6
65.6
71.0
84.0
95.6
A
B
A1
B1

FIGURE 4

The above tilted effect is not used whatsoever in our budget and is merely statistical information for the manager. It might be mentioned here that, at the end of five months, our 1931 sales were within three tenths of one per cent of the budget, adjusted by the tilted allowance. Therefore practically the entire further decline, since October 1930, was beaten, and that decline amounted to "sump'n", as Andy would say.

The reason that our management did not set their goal in accordance with business conditions, which were estimated to show an average of 16.5 per cent below normal for 1931, is because they were looking at the profitgraph, figure four. This chart told them the amount of business which had to be obtained to overcome the crisis point; what volume had to be obtained in order to earn preferred dividends; and the point below which common dividends were not earned. It also showed the dead line, or where a six per cent return was made on the invested capital; then where a ten per cent return was made and where greater ratios on investment were earned as volume increased.

The line A to A-1 represents the sales line. The line B to B-1, including the herringbone area, represents the fixed charges including the following items. First, there are the shut down costs, such as insurance, taxes and depreciation, less a rental credit, received from the rental of the excess building. Secondly, there are the salaries of the executive staff, superintendents, department heads and the remaining people who would be required to maintain the organization and who could not very well be eliminated. Thirdly, there is the interest on funded indebtedness, which is a fixed item in our case.

When the amount of fixed costs is determined, the requirements for preferred and common dividends are then included, making provision for Federal and State taxes. The per cent earnings required to make an adequate return on invested capital is known which might, as shown in this mythical profitgraph, be considerably greater than the return required for preferred and common dividends.

Upon making a provision for the fixed cost and earning requirements and knowing the ratio of direct labor, material and variable overhead costs to the sales dollar, the volume necessary to create the profit desired can then be determined on a ratio basis. Naturally, profits come first and variable allowances must be made accordingly.

It is believed that it would be well for every company to provide a reserve and budget for obsolescence as shown on the chart. This is true, especially in a period of business conditions such as we are experiencing today, when new products or changes in style are vitally essential for the purpose of interesting buying power, the adoption of which is thereby liable to cause obsolescence. The Department of Commerce data tells us that it costs at least ten per cent to carry an inventory, of which five per cent is for obsolescence. Therefore, as an example, if you have a $3,000,000 inventory, you should have at least a $150,000 reserve for obsolescence, applied on a monthly basis. Should the obsolescence reserve be unabsorbed in the current year, it is well to keep the remaining reserve, in addition to the reserve provided for in the following year, because you will no doubt find that style will, in some particular year, have a severe effect on your inventory. Quality alone isn't going to get the public to spend their money during these times, although, to be sure, quality must be in the product in order to maintain the customer and eventually cause a re-purchase. Today, it is a case of giving the public something that will attract them so that they will dig down in their pockets and buy.

The bathing suit industry is having one of its best years in 1931, or during the depression, simply because they put out a new style of suit and people would not be seen on the beach wearing one of the old styles. I know that I own a perfectly good old suit.

It might be mentioned that, although we were confronted with serious inventory losses in the years of 1925 and 1926, as a result of obsolescence caused by style changes and perhaps inadequate inventory control, our budget of obsolescence was held in both the years of 1929 and 1930 being within $1,000 of the budget for the year of 1930. Again, as production volume increases or decreases, the obsolescence provision should be increased or decreased, according to the size of inventory involved.

It is believed that the chart readily pictures the direct cost, variable cost, total overhead cost, cost of manufacturing and selling and the break-down in profits. Management can then tell, at any point of volume, the allowance for direct material, direct labor, other costs and the profit involved at the point of volume.

You will note that the budget is shown on the chart to be equivalent to a volume of seventy-one per cent. On the basis of the deviation at the side of the chart the 100% volume is indicated by

the deviation value of ten which could equal 1,000,000, 10,000,000, etc. Seventy-one per cent usage would thereby be equivalent to a volume of 710,000, 7,100,000, etc. The chart can be used at all times throughout the year on the basis of having the actual performance inscribed against the budgeted set-up. If the volume is under the budget, the management immediately knows the reduction required in manufacturing and variable expense items. You will usually

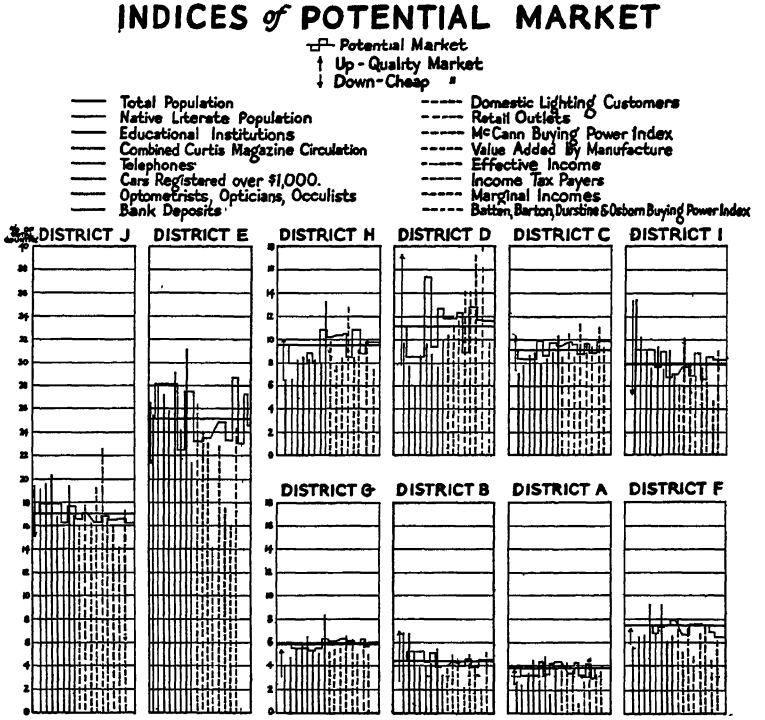


FIGURE 5

find that a chart of this nature will stir management towards increased volume in order to get the greatest return on their investment.

This chart can be prepared for almost any business. It will no doubt take you some time to produce it accurately for your own industry. Although the chart shown is of a mythical nature, we have prepared an actual chart for our own business which took some

few months to complete. When the chart was completed, it was presented to our management. While I have been with the company for a period of a little over four years, I had practically never been called to a directors' meeting, except for some special information. At the directors' meeting, subsequent to the recent completion and presentation of this chart, I was called in and asked to explain the profitgraph. When the talk was over, each one asked for a copy of the chart to keep in his own desk. It is believed that this was a case of the Controller's Division getting into the hearts of the executives with the use of a new tool. The chart was not only attractive but was drawn in colors. Colors will attract them: give them lots of it.

Rather than the management making a provision for the estimated average of 16.5 per cent drop in general business for 1931, they decided that they were going to take only a 7.5 per cent drop in their goal, before deviation allowance, and attempt to beat depression by the remaining nine per cent. How were they going to beat it? Would it be with new products entirely or would the use of our developed potential markets or buying power studies help. In our case, we used both. Our methods of arriving at the potential market will be briefly discussed.

Our territorial districts in the United States are cut up in two ways. We have a distinct set of districts for our ophthalmic business, which includes the lens and frame business, and an entirely separate set of districts for our optical and instrument business. The sales forces are entirely separated, not only for the ophthalmic and optical business, but in many cases, for the products within these lines, on account of their technical application. Therefore, we have the United States to segregate and work on in two ways, in order to obtain the desired facts and results.

The market study which will now be presented was made for our ophthalmic business. We will show you the various indices selected for determining the relative potential market for each product in each district.

Each of our ten districts are, in this chart, figure five, lettered mythically, such as, J, E, H, D, etc., representing New England, South East, Middle West, etc. The various indices used are shown at the top of the chart, such as cars registered over $1,000.; optometrists, opticians, oculists; bank deposits; domestic lighting customers; retail outlets; income tax payers, etc.

Each of the various indices used are plotted in each district according to the listing at the top of the chart. For instance, under district J, the first buying power line at the left is population; second, native literature population; third, educational institutions, etc. Then referring to the plot of the lines of the indices, you will note that district J has approximately nineteen per cent of the total population of the United States, approximately twenty per cent of the native literate population, and less than sixteen per cent of the telephone users.

Where a district such as indicated by "H" has low population, but high income tax payers, telephone users, car users, etc., it is a quality district (as indicated by the arrow pointing upward), such as New York and Boston. Where a district has the reverse, such as the south or as indicated by district E, and the arrow pointing downward, it is a poor quality district.

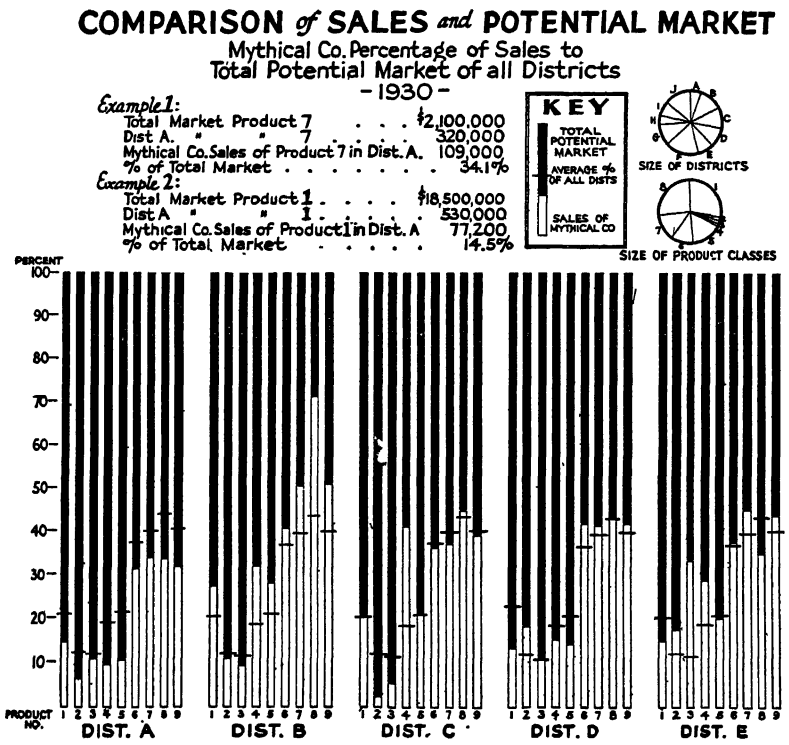


FIGURE 6

After the various indices were determined and plotted, we then selected the particular indices which we believed were characteristic of and adequately measured the relative distribution of buying power for our product number one; those indices which were characteristic of our product number two, etc. When we finished, we had a jagged line within each district, showing that, for instance, district E offered twenty-eight per cent of the buying power of product number one and twenty-two per cent for product number two, etc. When the buying power by product was completed for each district, a correlation was then made which determined the average buying power of the district, as finally shown by the straight horizontal line in the district, such as twenty-five per cent for district E. That covers the beginning of our market study. Now we go on to determine how we are performing against the determined market.

The Department of Commerce are doing some very fine work in the way of developing and issuing, through their industrial census of manufacturers, the total volume segregated by industry. I might say that one of the first things we did was to co-operate with the government in the development of a standard classification of products manufactured in the optical industry. We did this with the government because we were looking forward towards obtaining some genuine facts. Today, as a result of such co-operation, we feel that we are getting, for the first time, some real facts which can be used for measuring the performance of the optical industry by product class.

As an example, we will say that the census figures show that the total volume of product number seven is $2,100,000, figure six. The government does not give you this total volume spread by areas. However, as previously described, (figure five), we had already developed the relative value of each district to the total of the United States and especially in accordance with our own district segregation. In referring to district A, we had determined that the buying power for product number seven was worth 15.2% which would be $320,000. The $320,000 now becomes the 100% market for product number seven in district A, and the actual sales performance for district A is then measured against this total.

Should a measuring method contrary to the above application be used, results might possibly become distorted. For instance, the actual total sales for product number seven might be $1,000,-

000 which would represent 100%. The sales of product number seven in district A might be $120,000 or twelve per cent. This would seem to indicate that only twelve per cent of the volume distribution of product number seven was being obtained in district A, against a buying power as indicated to be 15.2% for the same product and district. The ratio basis of district A sales on product number seven to the grand total sales of product number seven could be entirely upset in making comparisons. That is, an unusual performance in some other district, which would thereby absorb a greater ratio, would cause the district A ratio of absorption to drop, even though the sales of district A might have increased.

When the market is divorced to an individual district, as originally described, and then the sales of that district are measured against the segregated market, a more definite and constant measuring stick is obtained, which can be used from year to year and immediately show an improved or declined condition.

It was found that we were getting only 34.1% of the market for product number seven in district A, as shown in figure six, while our average for the entire country was approximately forty per cent of the market.

As another example, the total market for product number one was found to be $18,500,000 of which the district A portion equals $530,000. The actual sales of product number one in district A, were $77,200 or 14.5% of the market, while the average absorption of the total market throughout the country was approximately twenty per cent. You will also note that district A fell below on all products, while district B was selling above the average on all but products two and three such as fifty per cent of the potential market of product number seven while the average throughout the country was slightly less than forty per cent.

When these districts are being studied, the question of the relative size of the districts will undoubtedly be raised. The clock chart in the upper right hand corner shows the relative size of the district, and the other clock chart shows the relative size of each product class to the total volume of business. These clock charts

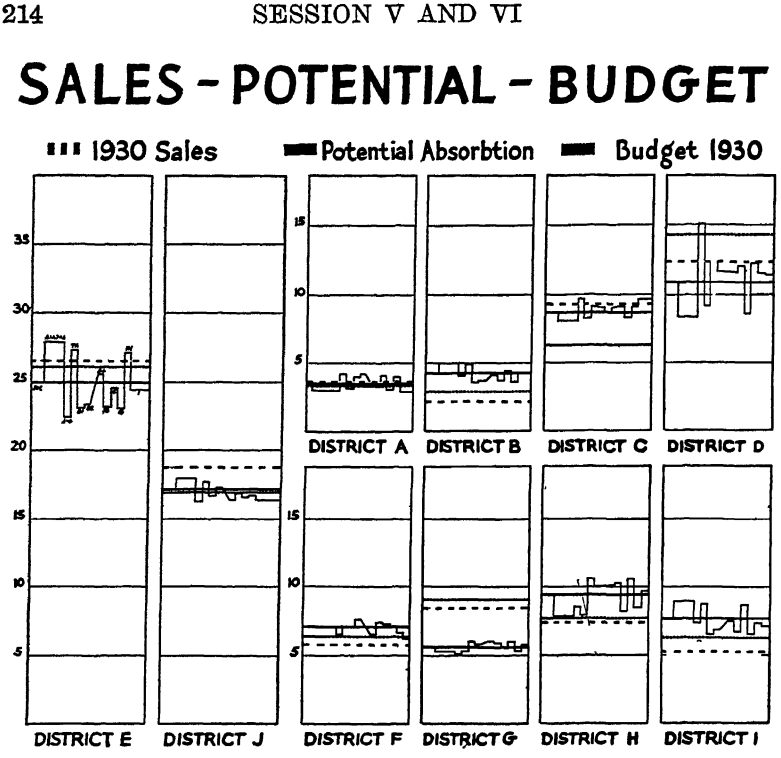


FIGURE 7

are shown in each district. The average potential absorption of all products is then shown in the district by the solid level line.

In setting the 1930 budget by districts, we did not have the knowledge of district potentials which we had acquired before setting the 1931 budget. In 1930, we were actually budgeting the districts with more volume than existed as now shown by our potential market studies. A company making a similar study would no doubt find that they were probably overloading some districts and obtaining such excess volume at unhealthy sales costs, such as excess salesmen, advertising expenses, etc.

In district B, for instance, figure seven, you will see that our budget (dotted line) was below the potential (solid line) and our sales (dash line) were below the budget, clearly indicating that we were not getting our share of either budgeted or actual volume. In district C, the sales were above the budget, but the budget was below the potential.

In an attempt to beat the 1931 depression, we actually selected

the districts which were buying below the potential market as being the best districts to aid in increasing and maintaining our volume. We did not raise the district budget to the potential in one year, as we realized that, in some cases, it would take several years to reach the buying power shown, if we were to obtain such volume on a profitable basis. We believe this move has aided us considerably in putting over the year of 1931 or increasing our

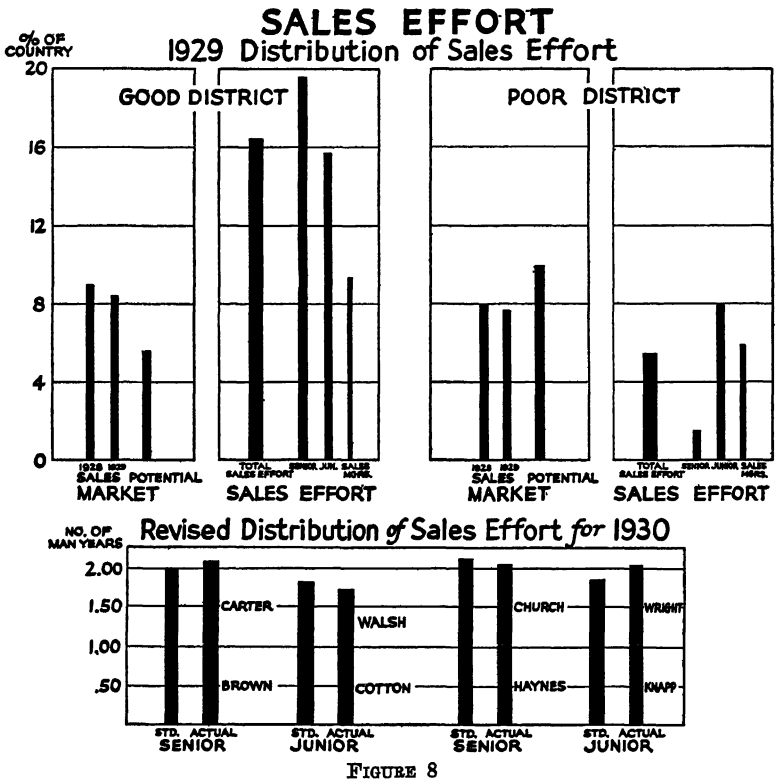


FIGURE 8

budget in districts such as B, I, and H, where we were not absorbing the potential power, and holding our own in what appeared to be normal districts, such as A, F, and E.

But then, how are we going to make increased sales in poor showing districts? We must study our road force and find out whether their time has been allocated to cover the districts in accordance with the market available in the districts.

Figure eight shows a comparison of sales effort with sales and potential market. It will be noted that the sales for 1928 and 1929 were beyond the potential market in the good district. Why? The sales effort placed in this district, broken down by senior effort, junior effort, and sales manager's effort, was almost three times greater than the potential market. In the poor district, the sales were under the potential for both years. Why? The sales effort was correlated less than half with what it should be in that district and potential market.

What did we do? Men were shifted from one district to another. Consideration was given to the trading areas within a district, making provision for the time required for mileage. For instance, the buying power in the New York City area is within close proximity, while in other areas, such as Texas, more time must be allowed and men allotted accordingly. Again, ninety per cent of

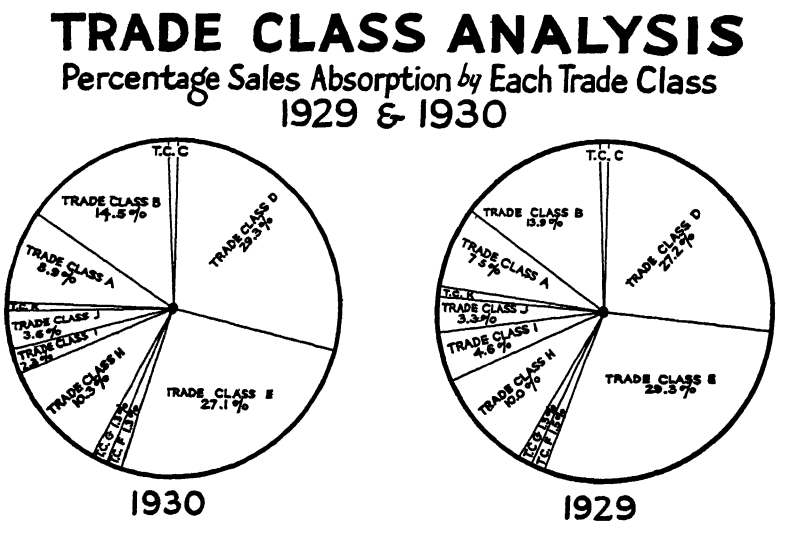


FIGURE 9

the district market might possibly be within ten per cent of the total area. Many other correlatives were considered and finally reduced to a standard of man-years required per district. The actual or revised distribution of sales effort is shown in the lower half of the chart, which clearly reflects the change made and the aid given to the poor district which, as shown on the upper part of the chart, contained approximately sixty per cent more buying power.

We not only want to know how sales are being distributed by country, state, district, trading area, customer, etc., but we particularly want to know what trades are buying from us. Figure nine shows our trade class analysis between foreign branches, schools and colleges, hospitals, governmental institutions, net accounts, industrial establishments, jobbers, retailers, etc. The chart shows the contribution of each trade class to the total business and the changes in trade absorption between 1929 and 1930. We have had an analysis, by trade class, from our tabulating machines, for the past four years. As a result of such analysis we have had some interesting developments in our business which were quite beneficial.

For instance, we formerly had a general sales manager functioning over divisional sales managers for each product. That is, in the vernacular of the clothing business, an individual manager for hats, shoes, ties, shirts, clothing, etc. The lens and frame, or ophthalmic line of product, consisting of about half of our business, was practically entirely distributed through jobbers and retailers and consisted of part of the foreign branch business. The remainder of our business, known as the optical, including optical lenses and their allied instruments, was distributed to the various remaining trades as shown on figure nine.

The analysis of our volume by trade class immediately proved to us that we were hardly scratching the industrial market and, in some areas, were obtaining little or nothing. Therefore, in 1930, we changed the set-up in the Sales Division and created an ophthalmic manager for the lens and frame line, an educational manager for the educational portion of the instrument business, and an industrial manager for the industrial portion. While we had formerly believed that, on account of the technical application of our various instruments, it was necessary to have an individual in charge of each product group, we now have our customer dealing

directly with the one individual continually, who covers all products for the trade involved. Consequently, their time is completely devoted in the contacting and development of trades rather than individual classes of product. In the first year of this set-up, our gains in industrial business were more than anticipated. We were well equipped with industrial facts to tackle the problem, as will be indicated shortly.

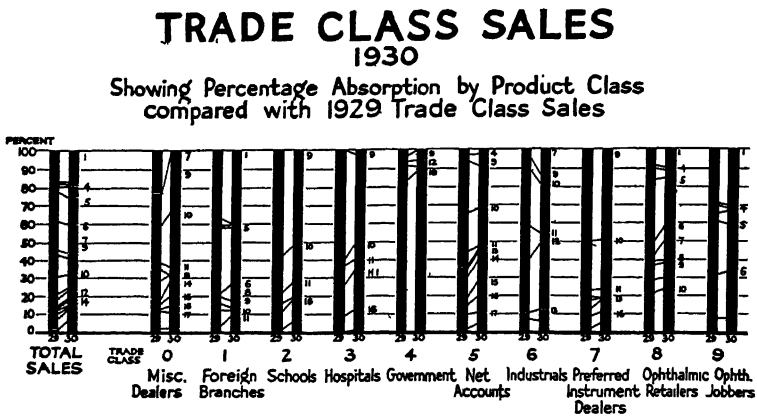


FIGURE 10

Figure ten shows the per cent absorption of each trade class by product class giving a comparison of 1929 and 1930. For instance, it will be noted that in the industrial trade class number six, product number twelve increased its absorption from thirty to thirty-five per cent while the absorption of product number eleven was reduced more than half. This chart clearly shows the products that each trade is buying on a comparative basis.

Figure eleven shows a segregation of the industrial sales research work indicating the sales of each product broken down to ten major types of industries. These ten major types of industrial sales include metal manufacturers; metal users; electrical equipment; foods; paper, pulp and lumber; chemicals; textiles; ceramics; miscellaneous and special fabricators.

However, we do not stop at this point of industrial sales analysis but take in a further breakdown of these ten major industries by the use of approximately one hundred sub-groups within the ten major industries, as mentioned above.

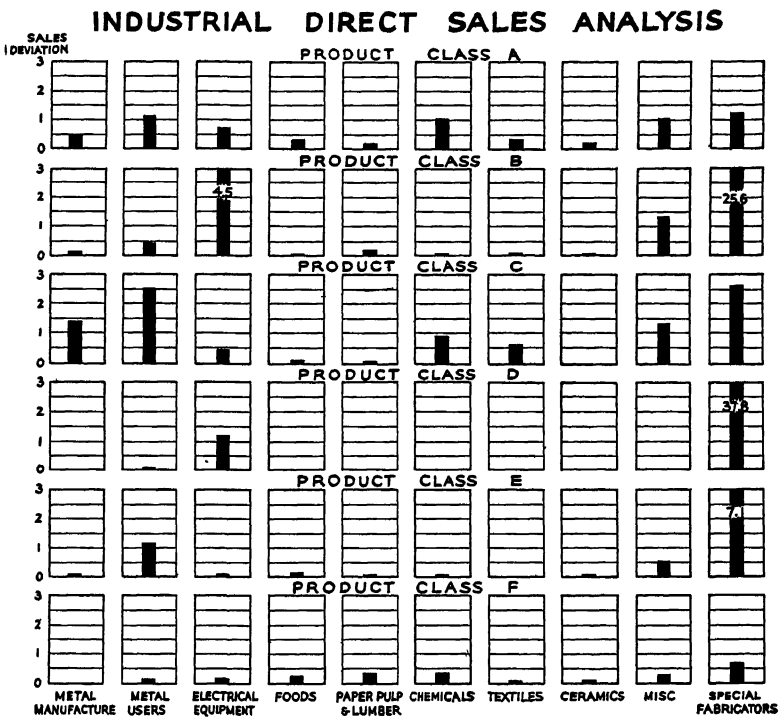


FIGURE 11

For instance, the food and kindred product industry is broken down to sugar refiners; bakery products; canning; prepared foods; candy and chocolates; meat and dairy products (see figure twelve). As a result of the facts now on hand, food experts were consulted to determine a further or the entire possible uses of our products in the food industry. Supplementing this work, a special catalog will be prepared indicating these possible uses. We have already developed a textile catalog, indicating the possible uses of our products for the textile industry.

For the year 1931, we had completed and adopted a customer budget. The sales budget for the nineteen classes of products were separately segregated to the ten districts. Each district had a specific set of customers for each one of these classes. We found by making a special analysis of our accounts in 1929, that a customer budget was rather an easy tool to prepare and one which we

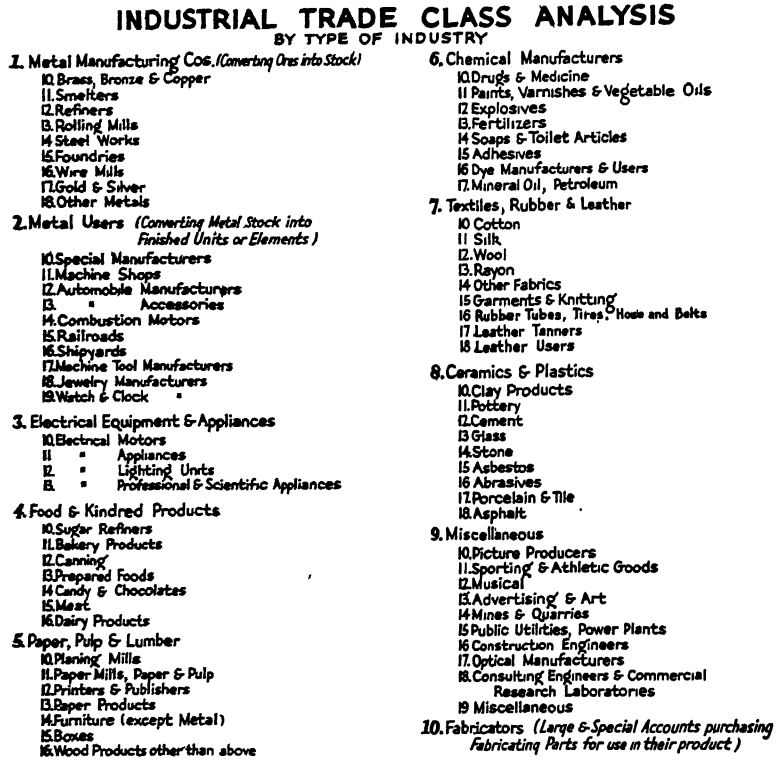


FIGURE 12

earnestly desired to have. In consequence, we are amazed at what is happening today in the way of control and performance.

This chart has been made mythical, of course, to show what might possibly be an average case in business. And, by the way, the Department of Commerce is putting out reports of this sort continually especially covering their Louisville grocery survey. For instance, as shown in figure thirteen, thirty-three per cent of the volume was obtained from .4% of the customers whose volume was over $100,000. Twenty-two per cent of the volume was obtained from .4% of the customers whose volume ranged between $50,000 and $100,000 or averaged $84,100. If you study the chart, you will note that the various customers were selected according to range of size. Also, as the size of the customer became less, the volume was reduced at a greater rate including an increase in the

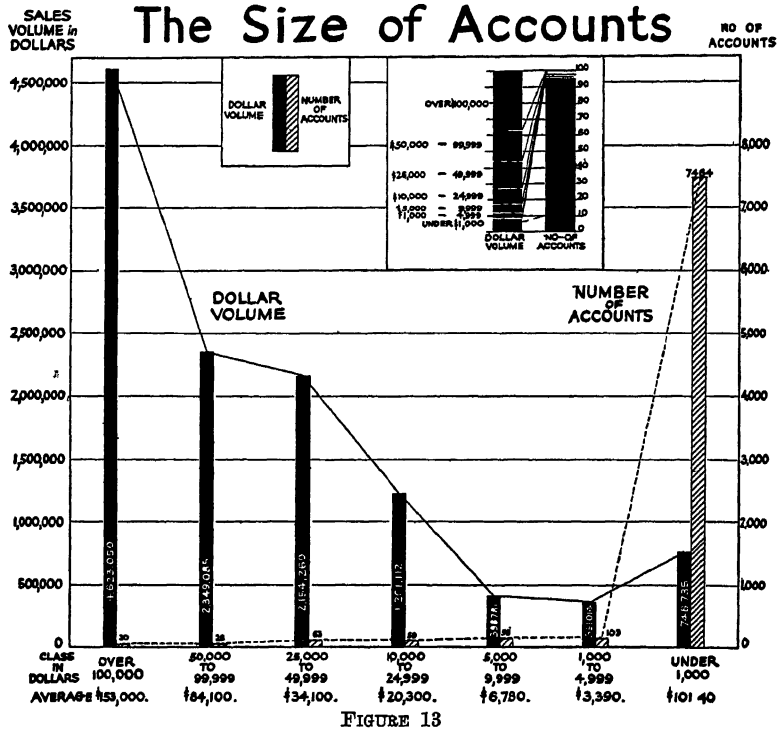


FIGURE 13

number of customers, until it reached the "under $1,000" class of customers.

It is interesting to note that, in order for the company to obtain approximately seven per cent, or the remaining volume of their business, they were obliged to deal with a total of 7,464 customers whose purchases averaged only $101.40 each. Without going into further detail, it will no doubt be realized that it is very costly to plan, produce and account for small size customers. In some cases the total order-handling cost might be eighty cents an order to cover orders ranging as low as fifty cents each.

Naturally, with the use of this chart, our effort has been to sell the Sales Department and management on the idea of getting $1,000 to $5,000 size of customer into the $5,000 to $10,000 bracket, and the $5,000 to $10,000 customer into the $10,000 to $25,000 bracket, and so on. In such a way, we can improve our business considerably both from the standpoint of volume and profit.

We deal with over 20,000 customers. Had we attempted to set a budget for each of these 20,000 customers, by nineteen classes of product, we would not only be in hot water in its preparation and cost but we would have swamped our sales personnel with voluminous records, similar to the alphabetical record of customer purchases which we were striving to get away from for control purposes. In 1929, we tabulated each month, by individual class of product, a customer absorption stack by size. That is, the customer who bought the most would appear at the top and thence the remaining customers, of that product in that district, followed by size to the lowest purchaser. Immediately, we found that we were able to cover ninety-five per cent of our volume for the product involved in any district by selecting a comparatively few customers and classifying the remaining as "others". Should the amount listed against the budget for "others" exceed the budget in any one month by any appreciable amount, such as being $10,000 instead of $5,000, we would then know that the condition was caused by some brand new or old customer, and we could immediately investigate and bring that customer's name on the budget, if necessary. The listing of the small accounts as "others" as a nominal budget figure does not lose the identity of any unusual performance of some unlisted customer.

Jobbers and retailers, who sell other products besides our own, were budgeted, giving due consideration to the potential market for the district involved. Our salesmen knew what we expected them to sell in the district and, moreover, where such volume could or should be obtained by customer.

Some of the men in this room have been in my office and seen the following set-up operate. Rather than go through over 20,000 records to find where our trouble is by customer and product, it can be found in less than twenty seconds. We turn to our total sales budget sheet, by class of product, as listed in the financial budget book, and find that the trouble is in product number one which is $20,000 under a budget of $200,000. Then we turn to our book of sales by districts and find that same $200,000 product budget and $180,000 of product sales broken down by district. We then note, for instance, that district number six was responsible for $16,000 of the total $20,000 shortage. We then turn to the customer budget book, district number six, product number one, and there is the total $16,000 shortage at the foot of the sheet, indicating that

Bill Jones is responsible for sixty per cent of the shortage and Tom Lang for thirty per cent, etc. It is then merely a case of a long distance call, wire, or the train direct to the customer, for there is your trouble in a nut-shell. That's cutting the job down from an analysis of 20,000 customers to one or two. Comparing what the customer is doing this year with other years doesn't mean a thing because we considered past years' operations and buying power when we budgeted him.

We have now made an attempt to cover the inception, reasons and needs for a budget and also, the research and methods which are used to establish an accurate sales forecast. It was mentioned that the accountant is a straight line thinker, and that when he went into the study of sales research, potentials, markets, and costs, he would consequently have a finer control and in the end be better off in both compensation and position.

There isn't any budget, in my opinion, that will function properly unless it is supported by a proper sales budget. Every other item in the entire budget depends upon the accuracy of the sales forecast. Therefore, we will start on sales and, as rapidly as possible, construct the complete or master budget in both units and dollars.

The entire sales budget is coordinated with the opinions of the sales managers, branches, and salesmen in the field. We, in the Controller's Department, do not try to originally set a definite sales budget, but we do try to assist the Sales Department, and cooperate with them. However, if we receive a "bogey" sales budget, or one which is far beyond what we think they can or will sell, we shoot it back to them, the same being true if their estimate is too low. We are continually consulting together until a mutually satisfactory total unit budget is attained.

Success in budgeting will never be attained until the sales budget is broken down into units, because only then can sales and production be properly controlled. Also, when jobbers, retailers, dealers, educationals, industrials, foreign, and other various types of trades are dealt with it will be found that the average price per unit will vary per district on account of the trade absorption within a district. In order to obtain the average price which applies to the individual district, we use past records of total units sold against total dollars received and obtain the average. For instance, in one district, seventy per cent of the distribution might be through jobbers where, naturally, relatively larger discounts would be

found. In another district where only forty per cent jobber and sixty per cent retailer distribution is found, a better average price could be obtained. Each individual unit entering into the sales budget is first priced by district. Then the like units and their relative values are assembled from each district and added to give the grand total units and dollars.

When the tentative total unit sales budget is completed, it is sent to the Cost Department which determines the cost of sales in the elements of material and labor. The tonnage, machine hours, direct labor hours, total hours, or whatever unit is used for measuring the use of plant capacity, is also added to this schedule. The material and labor cost and the use of the plant capacity is then submitted to the management. In case the proposed plant usage is indicated to be sixty or seventy per cent, the management might possibly find it necessary to create an increase in the sales budget. Should the proposed usage be indicated to exceed 100%, it would then be necessary for the management to appropriate expenditures for increased facilities, or else reduce the proposed sales budget. The latter plan is usually the most conservative, as many failures have been caused by over-expansion.

Before the sales unit budget, and consequent use of capacity, is finally determined it must be presented to the Production Division in order to be tested and possibly tempered according to inventory conditions. For example, there might be a sales budget for 1,000 units, while the production budget for those units might necessarily be set at 800 or 1,200 units, according to stock conditions. Therefore, while the production unit budget is coordinated with the sales unit budget, the quantities are often distinctive, on account of inventory conditions.

In preparing the allowable production budget, turnover must be given first consideration. The Production Division must be dealt with on the basis of attempting each year to attain a better turnover, both of process and finished stock. The production budget must be handled also, having in mind the allowable inventory for the new units which were developed and are to be made and sold in the new year. The dates as to when the new products are going to be produced and when they will be ready for sale must also be considered in both the sales and production budgets. Balance orders, if any, at the end of the year, must be considered in making the sales budget, because the Sales Department might possibly include

the balance order quantity in determining their normal sales budget. Such a set-up would result in an easy job for the sales force and also a sacrifice in sales quota for the company. The Engineering Department is expected to submit, by October 1, 1930, lists of the new units and the dates when they will be ready for production during 1931. After that time any new projects started are, most generally, for the 1932 sales.

The complete engineering expenditures are budgeted and segregated as to the scientific bureau, research and development bureaus, drafting, specifications, and other functions of the Engineering Department. We have attempted to increase these expenditures each year, by from two to eight per cent of volume, because we realize that our continued existence depends almost entirely upon the engineering development, especially of new products. It might also be added that while our Engineering Department, a few years ago, were spending eighty per cent of their effort on special orders, we are now attempting to spend eighty per cent in the development of standard unit lines of product in order to obtain re-sale benefits.

When the Engineering Department completes a new product, the tool expenditures are then authorized by them in accordance with the quantity to be sold as originally estimated by the Sales Department. When the Engineering Department reviews the sales budget a further check is made. For instance, should the Sales Department set up a total of 5,000 units, the Engineering Department would then go back to the Sales Department and state that 20,000 units should be sold rather than 5,000, in order to absorb the tool expenditure that had been allowed according to the original sales estimate. Again, if the Sales Department say they are only going to sell 5,000 units and the 20,000 new units were in process or finished for them, the consequence would be a four year's stock. Under such conditions the Production Department would also take part in going back to the Sales Department for a new estimate.

Upon establishing a complete coordination between the Sales, Production and Engineering Departments, the completed two unit budgets are then secured. That is, a sales unit budget and a production unit budget are established, the difference being an increase or decrease to inventory. The unit sales budget is computed and segregated by nineteen main classes of product, by customer and by district, and then summarized.

The next step is to place the sales budget on a seasonal monthly trend. That is, a seasonal monthly trend has been determined for each one of the nineteen main classes of product. It was found that each product had its own particular characteristic trend. A five-year study has been made and tempered in each subsequent year in order to determine these trends.

Seasonal monthly trends are extremely important for measuring actual performance against the budget. As an example, a product might indicate a $300,000 volume for the first quarter, which, if averaged, would be $100,000 monthly. However, when seasonalized the goal might then be $120,000 for January, $110,000 for February, and $70,000 for March. On the former averaging basis, the Sales Department might think they were doing well to obtain $100,000 for January, while on a seasonal basis they should have obtained $120,000. By the old method of averaging, the loss in volume would not be known until the end of the first quarter, or under extreme variations until the end of a six month's, or annual, period.

When our sales manager received his first budget for the month of January 1927, and when at the end of the month a red figure showed that he was under, he came in to my office and argued that we should put the budget on a quarterly averaging basis, because he was going to make it up in February or March. He hated to see red figures and at that time I thought I was going through the window. That same sales manager also argued that he did not see the necessity of having a daily sales record as our monthly record was good enough, even though it was obtained on the twentieth, or thereafter, during the folllowing month. Inside of four months he was coming into the office every day, both morning and afternoon, putting his arm around my shoulders, and asking "How are we coming *today?*" It seemed as though he just could not get into the harness quickly enough after he realized what it all meant. After being on a level line of sales for some seven years, he showed an increase of over twenty per cent in 1928, followed by a further increase, or a total of fifty per cent increase in volume in two years. Unfortunately he passed away about the middle of 1929, and it is exceedingly regretful that he was not able to see the results of his interest and efforts.

It might be mentioned that, in the year of 1927, we only had a sales and inventory budget. That is, we knew that when the sales

were low, the inventory should go up, and that when the sales were high the inventory should go down. While the sales budget was fairly accurate, the inventory budget was more or less based on a composite computation. It rested on past performance rather than the standards which were immediately developed and used in 1928 and thereafter. We have mentioned previously that one of the features which was adapted to our plan of budgetary control was that of stabilizing production and employment. Therefore, although our sales budget is laid out on a seasonal basis our entire production budget is laid out on a level line throughout the entire year. Perhaps the best way to illustrate our plan of stabilizing

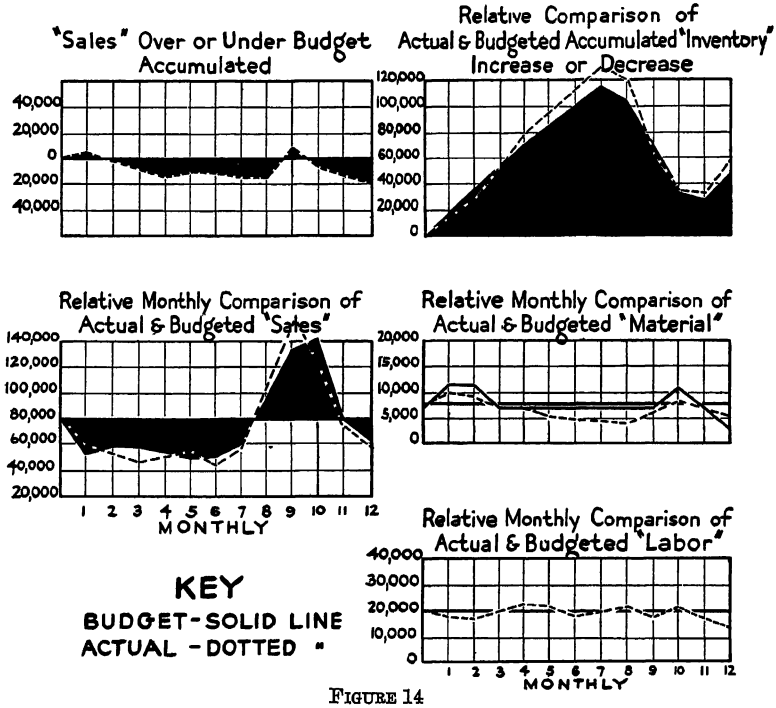


FIGURE 14

would be through your reference to figure fourteen. It might be mentioned that a chart of this nature is used for each of the nineteen classes of product, and brought up to date continually in our operating budget books. It will be noted that the items charted are of sales, sales variation, inventory, material, and labor.

In referring to the sales block, the seasonal monthly budget is shown by the solid line. The dotted line indicates the actual sales performance. We will assume the budget, for this line of product, was $960,000, which, when divided by twelve, equalled an average, for production purposes, of $80,000 per month. It will also be noted that during the first seven months and twelfth month of the year the seasonal sales are below the average line. In referring to the inventory chart you will note that, when the seasonal sales are below the level line of production, the inventory increases, and when the seasonal sales are above the level line of production, the inventory decreases. In referring to the labor section of this chart, you will note that practically the only variation in labor is caused by the variation in the number of working days per month, outside of the inventory shut-down in December. In referring to the material section of this chart you will find that it is practically level except for the castings, which are acquired in the early and latter part of the year, in order to allow straight line production on units which take from six to nine months to complete. Otherwise, all bar, sheet stock and other materials are brought in on a monthly straight line basis by direct purchase or committment contract.

In referring to the "sales over or under" section of this chart, you will note that the management could readily observe the break in March, which held through August, and the recovery through the September volume, finally reaching an accumulated actual total within $20,000 of the budget at the end of the year. You will note that when the sales were below the budget, the inventory was over the budget and that when the accumulated sales were over the budget, at the end of nine months, the inventory was under the budget. Also, that the final loss in sales of $20,000 was reflected by an overage in inventory of approximately $12,000. The reason that the inventory was budgeted for an increase of approximately $50,000 at the end of the year was due to work involved on the inception of new products which were to be sold in the following year.

As a result of pre-determined planning, the yearly labor fluctuation, above and below the average monthly number of employees, has changed from 33.5% above average and 10% below average number in 1924, to 3.1% above average and 2.6% below in 1929. In the year of 1930, during a period of depression, the maximum above average was only 4.3% and below 4.2%. The variation for the first five months of 1931 has only been 2.6% above

and 1.8% below. The result of such reduced labor turnover has naturally increased the good will of the company's labor, given constant employment to skilled labor, improved quality and service, and reduced many factory overhead expenses, particularly tool and machinery repairs and idle time.

A study of the above labor figures should clearly indicate that we are operating on a stabilized labor plan. In fact, the results of our plan have been used in the recent report made and published by Governor Roosevelt's New York State Committee on "The Stabilization of Employment".

Many industries believe that they are working on a straight line production plan, or, for instance, 10,000 units per day. However, a study of the various sizes involved within these 10,000 units might indicate an abrupt rise and fall by size. We have developed straight line production by individual size, and in so doing, in our lens line we have dealt with over 40,000 varieties.

I am going to show you two charts, in order to bring out how you can make a study of process operations, both machine and departmental. These charts have been made from actual studies in professional experience. That is, one of the first studies we made when systematizing was that of the process flow of material.

Figure fifteen shows a process study of a steel industry. It happened that they were obliged to cut down electric power consumption at the time, and therefore, first used the open hearth to get hot metal and then duplexed the metal to the electric furnaces.

After we made this chart, we removed zigzag operations between departments, and then made departmentalization for a cost system. Also, against the departmentalization chart, we added the floor space, the investment in the department, and the number of operatives. You will find such charts to be very helpful in methods work. I want to also show you a machine process chart, figure sixteen, which was used in 1920 in making a survey of a large cereal company.

Without a doubt, this company had a show place, which many people visited annually. Three plants were involved, being located in three countries. In our various studies, we included this chart, upon which the hand operations were indicated by various numbers. The management were amazed to find that their operations were only about forty per cent mechanical. As a result of this simple chart or picture, the management called in machine con-

sultants and eventually changed their operations from about forty per cent to eighty-eight per cent mechanical.

In our own plant we are continually making process studies of movements from floor to floor and department to department, in order to attempt to make a straight line flow of all operations.

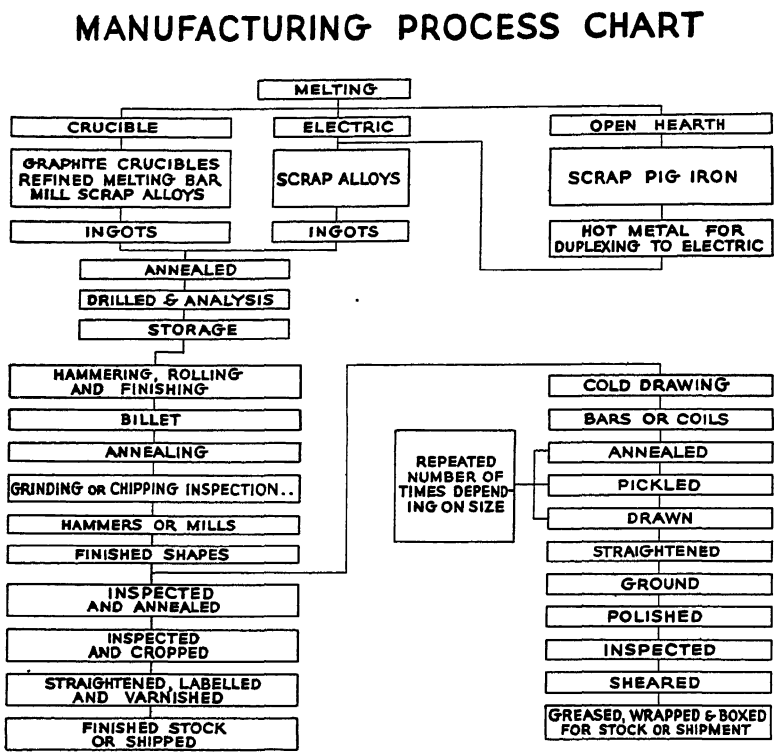


FIGURE 15

One of the interesting jobs I had at one time was the laying out of a new paper mill. We had one freight track running adjacent to the right side of the plant to the raw stock rooms at the back end of the plant. The stock thence flowed from the raw stock, towards the front, to the beaters, then the paper machines, and then to the finished stock. A track at right angles to the other track then removed the finished goods from the front of the plant. We were thinking of possible expansion. All that would be necessary

would be to expand the raw provision buildings, the beater, the paper machine, and other buildings in one direction, or to the north.

So many companies today are not thinking of the future in their construction, and consequently are facing high costs for trucking, transportation, etc., on account of zig-zag flow.

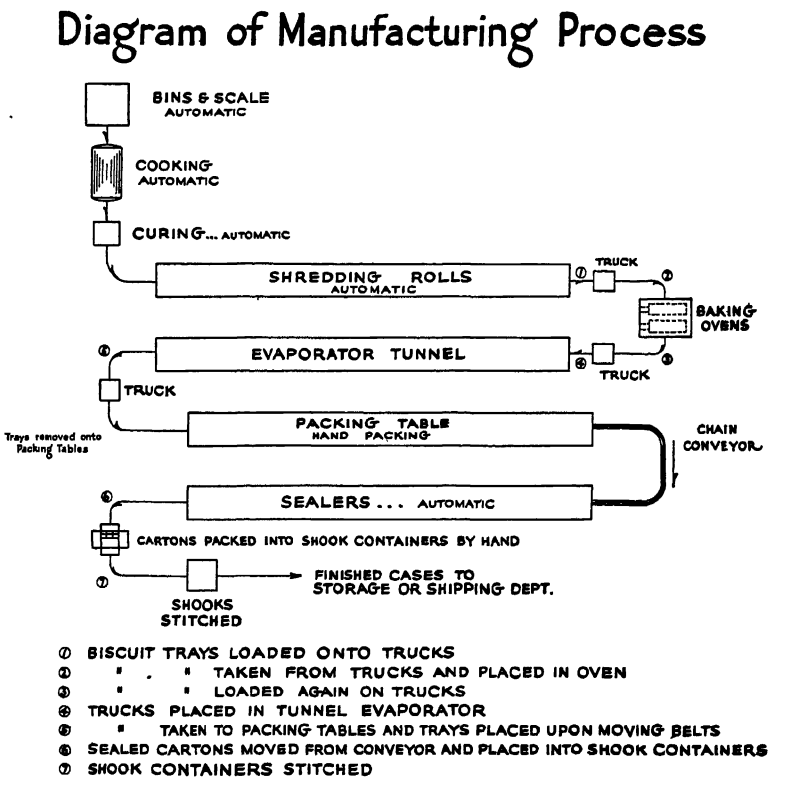


FIGURE 16

One other job we did in the way of a process study was for a large match concern which had been in business for many years. It was found that they were shipping the raw logs from the northwest. When the logs reached the match plant, they were cut into match blocks, at a block plant building, and then cut into match splints in the match machines. The cutting of match blocks at each

of the many match plants naturally involved a considerable investment in buildings and equipment. The process study eventually proved that all block cutting could be centralized in the west, and also that, instead of single block saws, multiple saws could be used. As a result, considerable savings were not only made by centralization and of investment, but particularly a saving of forty per cent in freight that had formerly been paid on the waste from the log, which occurred when making the match block.

I do not want to elaborate too much on this subject, but I do want to get the point over that this is a great time to study your process. Study your operations, put them together and chart them. Watch the direction, the point of holding, the point of rest. You will also no doubt be surprised at what can be saved by making a study of this nature in eliminating record forms and in straightening out the flow of forms.

It might be mentioned that, in preparing our monthly labor budget schedules for 1931, we did not divide by twelve months, but actually determined the total number of working days in the year, which were then divided into the total labor budgets, thereby determining the amount per day. A monthly determination was then made on the basis of the number of working days in the month in order to set up a more exact monthly schedule for management control. If you deal with a stabilized labor budget for the year and then divide by twelve months, you will continually find it necessary to make allowances each month for a greater or shorter number of working days per month. When the thirteen month calendar is generally adopted, such calculations will be unnecessary.

Upon completing the total labor and material expenditure requirements on the basis of the production budget, and knowing the proposed usage of the facilities, we are now prepared to develop the standard and actual overhead budget.

In referring to the profitgraph, figure four, the variable overhead allowance at each point of volume had been both determined and known during the course of developing the sales and production budget. Therefore, the next step in the budget procedure is to set up a control for overhead with an attempt to have the overhead completely absorbed through manufacture, and not cause a large under-absorbed overhead, which would be a direct charge to profits or surplus.

In reviewing the overhead situation, there are times, especially during periods of depression, when it might be found profitable to include and produce stock items on your production budget, rather than have a large under-absorbed overhead as caused by lowered plant usage. However, there are policy matters to be considered, not only on the basis of whether the goods can be sold at a future date, but also as to whether the savings in overhead would offset the carrying charges involved in the investment of such increased inventory.

In 1928, as a result of continued budget reviews made by the management with its divisional managers, our indirect labor and expense controls, as adapted to the budget, proved to be inadequate. The accounts were bulky and were not segregated on a functional or organization basis. Therefore, it was almost impossible for the management to hold any individual manager responsible for an overage against the budget. It was our first experience in budgeting indirect labor and indirect expense, and due to the large overage, in excess of $100,000, our manager finally agreed to allow us to install a functional set of accounts to cover indirect labor and expense.

The new indirect labor control involved 143 main departmental accounts, being further segregated by divisional managers and superintendents, and also by eight main divisional overhead points. The new indirect expense control amounted to approximately seventy accounts segregated in the same manner. In summary, our entire indirect factory operating accounts were fitted to our facilities and organization in a custom made manner, rather than according to the old-fashioned cut and dried method of taking a fixed system from a book.

As a result of the new set-up, which involved the control of several million dollars, we finished the year of 1929 within $1,002 of our budget. That, I believe, proves that such segregation was very profitable for the management. The results of 1929 could not be stated to be a lucky break, as we again enjoyed the same control in 1930, and, at the end of six months in 1931, were within $3,914 of the overhead budget.

A standard of overhead, obtained under normal conditions, is used, rather than a standard created through unusual conditions, such as might be caused by the depression during 1930-31. Through the use of such a standard overhead, we are able to indicate to the

management the exact amount of over- or under-absorbed overhead which will be incurred as a result of the operations for the year. We are also able to deal with the opening inventory, charges, cost of sales, and ending inventory, on a standard overhead basis. Naturally, if your volume were to be low for 1931, you would not be able to charge in the under-absorbed overhead, as a result of idle usage, if you were going to meet with competitors who had greater usage of their plant and consequent normal overhead absorption.

As an example of our overhead control, it might be mentioned that we had a slight cut in direct labor during the first five months of 1931, which would have caused an under-absorbed overhead. However, the actual overhead was almost automatically cut, in order to meet the overhead standard, which resulted in being in perfect balance with the forecasted overhead variance.

In developing the actual overhead to be allowed, it is not based on last year's, or any previous or average year's performance. It is based on a standard allowance according to the volume to take place in the year being budgeted. Having a break down of our complete indirect labor and expenses, we are able to use various selected indices for measuring the allowable overhead for each item of labor and expense. A chart is used for each characteristic type of indirect labor and expense. The variable volume scale is indicated horizontally across the base of the chart. The variable number of people or dollars involved in the indirect labor or expense control is indicated vertically at the left side of the chart. A curve is then plotted, which might indicate, for instance, that at 40,000 units per week sixty stock clerks would be allowed, while at 50,000 units of production seventy stock clerks would be allowed. This method can be applied using units, machine hours, labor hours, tons, or any other unit of measure, which will properly correlate with the various indirect labor and expenses involved. An individual standard is then determined at each point of volume for power, stock clerks, inspectors, truckers, tool repair, machine repair, etc. For instance, in measuring power we use machine hours, while for production clerks the number of units is used as an index. It is believed that each industry has its own particular problem and that there is no set rule for the unit of measurement to be used for determining the allowance. However, a genuine control can be ob-

tained through the adoption of a variable standard for each item of indirect labor and expense.

Before leaving this point, it might be mentioned that the functional set up of our indirect labor has given us a genuine opportunity for measuring the cost of planning and scheduling each of the various lines of products, or, in other words, a direct segregation of costs which were formerly indirect.

When the indirect expense and labor budgets are approved and a standard is set for each division, it then becomes necessary to spread these budgets on a monthly basis throughout the entire year. You must consider items such as heat, light, repairs, moving, etc., on a seasonal expenditure basis in order that your monthly budgets of these items will be as nearly accurate as possible.

The budgeted overhead is then given to each of the factory superintendents in its complete form, having been broken down to cover the total for which each individual superintendent is held responsible. It is segregated by fixed, semi-fixed, and variable groups of items, indicating a standard for each item and a total standard for the division. It can be sincerely stated that with the use of such tools, our superintendents are keeping their overhead almost in perfect line with the standard. They know what is involved, and in cases where direct labor had been cut to any greater extent, they work very hard to reduce their variable allowance to the extent of offsetting the increased ratio of fixed charges, in order that they may keep within the allowed total standard overhead. Our works manager has actually made the statement that he has been greatly relieved by the use of this control, and that his superintendents were now genuine managers of their own divisions.

The final pre-determined standard overhead is now applied to both the cost of sales and expenditure budgets. That is, we had previously determined the labor and material cost in the cost of sales budget, and the labor and material expenditures involved in the consequent production budget. We now have completed the total cost of sales, and the total expenditure budget.

In determining the budget of inventory increase or decrease, it is now merely necessary to stack the cost of sales by product class and by month, against the expenditures by product class and by month. The deviation between the cost of sales and the expenditure budget for each month now becomes the budget of inventory increase or decrease per month.

*Product A.*

| *Month* | *Expenditures* | *Cost of Sales* | *Inventory Monthly* | *Inc. or Dec. Accumulative* |
|---|---|---|---|---|
| January | $100,000 | $80,000 | | $20,000 |
| February | 90,000 | 70,000 | +20,000 | + 40,000 |
| March | 95,000 | 115,000 | −20,000 | + 20,000 |

etc.

We have actually budgeted the inventory increase or decrease by nineteen main divisions of product, both on a monthly and accumulative basis for the entire year.

In all of my experience I have never found a set-up which proved as satisfactory in being able to budget the inventory increase or decrease. As previously mentioned, one of our most severe problems was that of controlling inventory, especially due to the many thousand varieties involved. Inventory losses during the years 1924, 1925, and 1926 were most severe, due to style changes, stagnation, and obsolescence.

Inventory is generally the most vital item to control in industrial operation. As an example, which I have given many times, a plant might have a volume of $1,000,000, a cost of sales of $600,000 and a net profit of five per cent, or $50,000. The turnover might only be two times, on account of the length of time taken to produce the article, and the average inventory involved would therefore be $300,000. A ten per cent increase in inventory would result in sixty per cent of the profits being placed in inventory. A ten per cent stagnation or obsolescence of this inventory would cause a shrinkage of sixty per cent in the profits. Therefore, inventory increase or decrease deserves the utmost consideration.

Our total inventory is several million dollars. In 1929 we were within $40,000 of the budget inventory, $30,000 of the increase being due to the inception of new products. In 1930 the inventory was within $5,000 of the budget. In 1931, our budget of inventory control calls for a $300,000 decrease, as a result of improved methods and increased turnover, and at the end of five months, we are within approximately $1,000 of our budget. Many of the people in this room are going to feel that perhaps there has been some juggling to these figures. However, while they appear to be of an uncanny nature, it happens that our chairman, Mr.

James, has seen these figures and would probably help me out, should there be any question of verification.

In the development of the profit and loss statement, we now have completed the sales, the expenditures, including material, labor, standard and actual overhead, the inventory increase or decrease, the cost of sales at standard, and have thereby arrived at the standard gross profit.

It might be mentioned that we apply against the inventory a standard reserve for obsolescence, which is budgeted and applied on a monthly basis. The reason for using such an obsolescence reserve was previously covered. During the past three years, 1929, 1930 and 1931, our control of obsolescence has been held within the budgeted figure. It seems that both the Production and Sales Departments are watching obsolescense continually from a budget viewpoint, and that a genuine control has been obtained.

Before leaving the set-up at the point of gross profit, I do not want you to get the idea that because our budget is made on an annual basis, it is of a fixed nature. We do not disturb our annual budget, at any time during the year, on account of the amount of work involved in its complete preparation, and on account of the faith and courage which would be continually lost through adjustments. However, we do have what we call our flexible adjustment schedule. At the end of each month we submit a schedule which is based on sales variation, and any possible process cost variation. It would take considerable time to explain the method of arriving at this flexible set-up. The results are, for instance, that we show that on product A the labor is $5,000 under the budget, and, due to conditions, the allowable variance should be $8,000 under the budget. The third column on this schedule would then show that an additional cut of $3,000 was necessary. The same would be true for direct material. The final statement would then show, by each class of product, whether it was necessary to cut or spend, resulting in a net allowance for the entire plant.

A variable control will also show that, for instance, should sales be four per cent under the budget, and cost of sales six per cent under the budget, the expenditures, if properly balanced through the flexible schedule, would be six per cent under. Such control would automatically result in the inventory being in line with the budget. Our ratios of cost of sales and expenditures were practically in balance at all times during the past three years, as

we previously indicated by the statement of the results of inventory control against the budget.

The next step in the development of the budget is that of budgeting administrative and selling salaries and expenses. Naturally, we set up these expenditures in line with the gross profit available, in order to obtain the desired net profit. Originally, we had a flat rate of selling expense that was used in general throughout the entire line of products. However, we knew that if we were to obtain a true or accurate sales cost it would be necessary to re-build our entire selling salaries and expenses on a functional basis, similar to the set-up which was made for the control of indirect labor and expense.

When we completed our set-up for determining the actual distribution cost of a product class, we found that, for instance, rather than the old flat rate of twenty per cent for all products, the rates created varied all the way from ten per cent to fifty per cent for each class of product represented. This set-up was certainly different from the old method. Many department heads argued that we would soon put them out of business, and consequently were at first not over-willing to face the true cost, especially those where the cost was found to be far above the former normal rate of twenty per cent.

During the first year of this set-up, we had a comparatively small amount of our expenses charged directly to the product classes. However, at the present time, we have over ninety per cent of our expenses directly charged to product classes, and in another year we will no doubt increase that percentage. While all expenses are made direct to product class, the salaries are first segregated directly to groups of product classes, which are covered by individual salesmen. For instance, in the vernacular of the clothing industry, some salesmen sell shirts, collars, and neckties; others, suits, topcoats, and overcoats, etc. When the salesmen are selling three main product articles, such as shirts, collars, and neckties, their salaries are spread to these three products on the basis of the volume involved, as set up by the predetermined budget. We not only have the total control of salaries and expenses by product, but also have such items controlled by district and by product.

In developing selling expenses and salaries on the basis of gross profit available and net profit desired, there are some cases where

management might actually set up a budget which would exceed the amount allowed, for a current year, in order to obtain future benefits. That is, a normal advertising program for a product might be $50,000 per year. However, on account of a new product entering into the line, the advertising might be increased fifty per cent, and show a deliberate net loss, on the basis of anticipated recovery or benefits to be derived from future operations. Again, in a similar manner, a territory might need and be given an unusual sales effort in a particular year, which would thereby cause a predetermined loss. It is evident that the use of budgetary control, in this instance, clearly informs management as to their future destiny.

When the budget of selling expenses and salaries is completed, a standard distribution cost is determined, and used during the entire year for both estimating and for product profit and loss statements, the latter of which will be subsequently described.

The development of sales salaries and expenses by class of product has more than paid for itself. Rather than put us out of business, it has given us a true cost to deal with on a competitive basis. When it is realized that most industries work to their utmost to obtain factory costs to the last mill, it can not be understood why they have stopped at that point and neglected to analyze, in many cases, one third of the total cost or that which is involved in distribution. When you have made an analysis and compiled a setup for distribution costs, you will no doubt find it a more interesting problem than that with which you were confronted in analyzing factory costs. In our own case, the possible savings in cost and increases in revenues through correct selling prices, were much greater, on a ratio basis, than the savings which could be obtained in the factory.

When the total budgets are completed for selling salaries and expenses, they are then spread on a monthly basis, taking into account any seasonal expenditures, such as shipping, advertising, broadcasting, etc.

We have now arrived at the net profit by class of product and for the entire business. Upon completing the total profit and loss statement, the general costs and revenues are deducted from the consolidated statement only, and not by product class.

Rather than it being necessary for the management to wait for the annual profit and loss statement, which is usually completed

several months after the year has ended, they now know both the monthly and annual picture fourteen months ahead of time. Their fort has been built before the attack, and they can immediately work on policy matters throughout the entire year. They can adjust what has been put before them, rather than hope for fourteen months that the results will bear considerable luck. The work of the managers for the forthcoming year is practically completed, and it is now merely necessary for them to see that everyone meets the goal that has been assigned to him. It is unnecessary to make a complete or elaborate review of the business from week to week, or month to month, as the actuals against the budget immediately indicate when and where any possible variances might have occurred. It is believed that you will generally find that when your management is given such a tool they will then be thinking of what is to be done in 1932 and 1933 and feel that the job for 1931 has been practically completed.

Although we have developed and used nineteen actual and budgeted main product class profit and loss statements, we have also found that it is profitable for us to make a quarterly statement of profit and loss by the product sub-groups within each one of these nineteen main summary statements. That is, again in the vernacular of the clothing industry, we might have an individual monthly profit and loss statement for clothing, shoes, hats, etc. By a statement of product profit and loss we mean that you would take the clothing portion of the business, for instance, and break it down by style sub-groups, such as single-breasted suits, double-breasted suits, two-piece suits, tuxedos, etc. You would not go into the color or kinds of cloth in the first or original set-up until you had found where trouble existed.

Our set-up for each main product group shows, at the left of the schedule, a vertical listing of each sub-group, by number and name. The columns against each sub-group are as follows: cost of sales; percentage cost of sales; cost of sales plus standard selling expenses; percentage of total sub-group cost to total related sub-group sales; percentage net profit of the sub-group; percentage that the sub-group net profit is to the total net profit of the main product class; percentage of sub-group sales to the total sales of the main product class.

We had thought that we had a valuable segregation by using nineteen main product profit and loss statements. However, I

can assure you that, when we broke each one of these nineteen profit and loss statements into product sub-groups, we were very much more enlightened. These statements are not of a cumbersome character, and only cover a single sheet for each product class, being largely developed by the use of our tabulating machines.

The former profit and loss statements by main class of product, might indicate to the management that a ten per cent net profit was being derived, which to them would probably be entirely satisfactory. However, upon reviewing the rather simple profit and loss statement by *product,* and finding that there were profitable products within this main class which were carrying other products sold at a loss, the management would undoubtedly become alarmed and take action. That is, a product with sales amounting to only two per cent of the total sales of the main class, might be shrinking the profits of the ten per cent class, on account of being sold at a loss. Under such conditions you would undoubtedly dispose of such a low volume product. That is, offsetting a loss in volume of two per cent, there would be an immediate recovery of profit ratio, from probably ten per cent to twelve per cent, and an actual increase of ten per cent in profits. However, when the volume of a product which carries a loss amounts to eight, ten, or more per cent of the total volume, you would no doubt make every effort to improve conditions. A detailed tabulated run would then be made of that product group by type, color, size, etc., and submitted to the management so that they might work on the basis of first reducing the cost through the works manager, and if this were impossible, attempt to correct the price through the sales division.

It is believed that if you asked any one in our organization as to what he considered the most valuable item of control now in use, he would probably tell you the profit and loss statement by product group. It has thrown an entirely different light on our business and it is believed that it would be almost impossible for us to abandon this schedule. As an example, one of the main product classes which was ten per cent in the red in 1928, immediately went to six per cent in the black in 1929, and seventeen per cent in the black in 1930. We feel that we have hardly scratched the surface in making the complete use of this tool of control.

There are no doubt many industries which are forced by competition to add a variety of products to their line which might pos-

sibly be loss items. One of the interesting procedures that we went through was to show our management, by product class, a total of the sales and losses involved on loss items. Management would no doubt be amazed should they find that a small amount of their sales volume, or for instance, five per cent of the total, might be shrinking their profits twenty per cent. During the past two years we have cut in half the percentage of total sales volume which carried a loss.

The standard direct selling expense plays an important part in the profit and loss statement by product. As an example, we found in one case that the cost of sales and expenses for a product class were far beyond normal, and that a profit could not be shown unless some new product were developed which would thereby increase the volume of the class, or unless the sales force and expenses were reduced. The result was that new products were added and the volume was almost doubled in the past two years. The sales force of that class, who were highly trained specialists, were maintained.

Before going on it might be mentioned that we now give each one of our divisional sales managers a budgeted and actual statement of the profit and loss of his product. Our management did not want to release this statement to our sales managers, until they finally realized that in order for a sales manager to function properly he should be able to view sales, cost of sales, gross profit, expenses, and net profit. For instance, a sales manager might be controlling his selling expenses in an ideal manner, and according to the budget. However, when these expenses were set up on a profit and loss sheet, he might find that, due to sales variations, there should be a cut in expenses in order to maintain the desired net profit. However, he might further find that the lowered sales were off-set by an improved gross profit, as a result of lowered cost, which would thereby allow him to make a lesser cut in selling expenses. Without going into further detail, it is believed that the adoption and use of such a statement by the divisional sales managers will soon prove its worth to the company.

Another item which should be mentioned before leaving this set-up is that, when operating under seasonal sales conditions, the selling expenses and salaries ratios are high and low at various periods during the year. We take care of this variation by superimposing our standard selling cost for the year, by profit and loss

standards for the seasonal month involved. That is, the standard for the year might be twenty-five per cent, while in January it might be thirty-five per cent, due to low volume, and in September fifteen per cent, due to high volume. This set-up is merely used for monthly profit and loss budget purposes, while the pre-determined standard for the year is used for the estimating or setting of prices.

Upon completing the entire operating budget, we now are ready to prepare the cash budget. In setting up the cash budget, it is not taken from a "sky hook", or out of the air, but is completely coordinated with the budget of operations. Each operating budget is subsequently adjusted separately to a cash basis for the cash budget. For instance, under manufacturing expense, depreciation is entirely removed. Taxes are entirely removed and then put back for cash purposes, on the basis of when they are paid, such as January and July. Insurance is handled in the same manner. Royalties are taken out in full and then put back on the basis of when they are paid. Bad debts are entirely removed from administrative expenses. In short, all items which do not involve cash are entirely removed, while all other items enter the cash budget on a schedule of pre-determined payments.

One of the most important items in the cash budget is that of receipts from collections. When general business had its fall in October, 1929, there were many jobbers and retailers who subsequently reported that their collections were twenty, thirty, or forty per cent below normal. It was at that time that we decided to make a collection graph. We made a study of collections, which covered a rather long period, in order to determine what percentage of our collections were normally in on the first, second, third, or, in complete sequence, for every day of the month. At the bottom of the collection graph we placed the days of the month horizontally, and at the side of the collection graph we placed from zero to 100% vertically. We used percentage rather than dollars, as in such a manner it would be unnecessary for us to plot a new chart each month on account of variances in sales volume. Our collections are on a thirty day basis, a two per cent cash discount being allowed for payment received prior to the tenth of the month. We first plotted two charts in two ways; collections against the past month's sales, and collections against the accounts receivable balance. However, we found the first set-up preferable, as otherwise we were not reaching 100%, and because we believed that collections

generally had a normal ratio of stagnation. Therefore, it was merely necessary to set up the previous month's sales and for the cashier to accumulate the collections each day, merely sending to the credit manager the per cent received to date.

If you were to look at this collection chart, you would almost find a beaten path of actual collections along the standard collection curve. If the actual varied at any time, you would find that the collection manager was immediately pulling his control files and doing his utmost in the way of letters, wires, or phone calls to meet and maintain the standard ratio of collections. It was merely another case of proving that a standard is the best thing in the world to give one as a goal.

In the handling of our foreign collection chart, we ante-date our sales three months prior to the collection period involved, and use that volume for our current collection standard. In your own industry, your method of collections might be entirely different, but you will find it profitable to use such a standard chart according to your set-up.

When working on a stabilized plan of production, you will find that the use of a cash budget is vitally essential. That is, your stabilization plan of production might call for an inventory investment at certain periods of the year, which, when presented on the cash budget, would readily show the management when the time arrived to borrow money and when to pay back. That is, the cash budget gives the total receipts, disbursements, and net ending balance which is then added or deducted to the balance at the beginning of the period. The cash balance at the end of each period is also broken down by types of cash funds.

Although the sales of each class of our products are extremely and distinctly seasonal, it might be interesting for you to know that, as a result of stabilizing our production, the maximum total inventory increase at any month of the year was found to be only approximately five per cent, as reflected by the correlation of all products.

In closing, I am going to present to you the forms on which the actual and budgeted records are displayed, including some of the main tabulating forms. I especially do not want to give you the impression that we have an excessive number of forms, as we have tried to standardize them as much as possible. In fact, right now we are making a complete form survey of our entire forms and

SUBJECT: _____ MONTH: _____ YEAR: _____

| DESCRIPTION | LINE NO. | BUDGET TOTAL | MONTHLY ACTUAL | MONTHLY BUDGET | MONTHLY OVER OR UNDER | ACCUMULATIVE ACTUAL | ACCUMULATIVE BUDGET | ACCUMULATIVE OVER OR UNDER | % | LINE NO. |
|---|---|---|---|---|---|---|---|---|---|---|
| REGULAR WHITE | 1 | | | | | | | | | 1 |
| DOUBLES | 2 | | | | | | | | | 2 |
| PERISCOPIC | 3 | | | | | | | | | 3 |
| MENISCUS—SEMI | 4 | | | | | | | | | 4 |
| " UNCUT—EDGED | 5 | | | | | | | | | 5 |
| FLAT CYL'R.—SEMI | 6 | | | | | | | | | 6 |
| " " UNCUT—EDGED | 7 | | | | | | | | | 7 |
| TORIC CYL'R.—SEMI | 8 | | | | | | | | | 8 |
| " " UNCUT—EDGED | 9 | | | | | | | | | 9 |
| WAFERS | 10 | | | | | | | | | 10 |
| MOULDED BLANKS | 11 | | | | | | | | | 11 |
| | 12 | | | | | | | | | 12 |
| | 13 | | | | | | | | | 13 |
| REGULAR CROOKES | 14 | | | | | | | | | 14 |
| MENISCUS—SEMI | 15 | | | | | | | | | 15 |
| " UNCUT—EDGED | 16 | | | | | | | | | 16 |
| TORIC CYL'R.—SEMI | 17 | | | | | | | | | 17 |
| " " UNCUT—EDGED | 18 | | | | | | | | | 18 |
| MOULDED BLANKS | 19 | | | | | | | | | 19 |
| | 20 | | | | | | | | | 20 |
| | 21 | | | | | | | | | 21 |
| REGULAR SOFTLITE | 22 | | | | | | | | | 22 |
| MENISCUS—SEMI | 23 | | | | | | | | | 23 |
| " UNCUT—EDGED | 24 | | | | | | | | | 24 |
| TORIC CYL'R.—SEMI | 25 | | | | | | | | | 25 |
| " " UNCUT—EDGED | 26 | | | | | | | | | 26 |
| MOULDED BLANKS | 27 | | | | | | | | | 27 |
| | 28 | | | | | | | | | 28 |
| | 29 | | | | | | | | | 29 |
| ORTHOGON WHITE | 30 | | | | | | | | | 30 |
| MENISCUS—SEMI | 31 | | | | | | | | | 31 |
| " UNCUT—EDGED | 32 | | | | | | | | | 32 |
| TORIC CYL'R.—SEMI | 33 | | | | | | | | | 33 |
| " " UNCUT—EDGED | 34 | | | | | | | | | 34 |
| | 35 | | | | | | | | | 35 |
| | 36 | | | | | | | | | 36 |
| ORTHOGON SOFT-LITE | 37 | | | | | | | | | 37 |
| MENISCUS—SEMI | 38 | | | | | | | | | 38 |
| " UNCUT—EDGED | 39 | | | | | | | | | 39 |
| TORIC CYL'R.—SEMI | 40 | | | | | | | | | 40 |
| " " UNCUT—EDGED | 41 | | | | | | | | | 41 |
| | 42 | | | | | | | | | 42 |
| | 43 | | | | | | | | | 43 |
| FINISHED Parts | 44 | | | | | | | | | 44 |
| | 45 | | | | | | | | | 45 |
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**FORM 612**
**Record of District Sales by Unit**

NOTE:
The same Units are printed on Form 905 - Record of Sales to Customer by Unit, and on Form 989-1-Record of Total Units Produced and Sold.

FIGURE 17

D & L CODE NO. _____ CITY _____ STATE _____ CUSTOMER _____

| DESCRIPTION | Line No | JAN. | FEB. | MAR | ACCUM 3 MONTHS | APR. | MAY | JUNE | ACCUM 6 MONTHS | JULY | AUG | SEPT | ACCUM 9 MONTHS | OCT | NOV | DEC. | TOTAL YEAR | 1929 | 1930 | Line No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | | | | | | | | | | | 1 |
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**FORM 905**

**Record of Sales to Customer by Unit.**

CUSTOMER'S UNIT PURCHASE RECORD 1931

FIGURE 19

PRODUCT CLASS M. CUSTOMER BUDGET

DISTRICT NO. X. MONTH January YEAR 1931

| DESCRIPTION | CODE NO. | LINE NO | BUDGET TOTAL | MONTHLY ACTUAL | MONTHLY BUDGET | MONTHLY OVER-UNDER | ACCUMULATIVE ACTUAL | ACCUMULATIVE BUDGET | ACCUMULATIVE OVER-UNDER | % | LINE NO |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SEASONAL NORMAL | | 1 | 1931. | | Actual 1930 | Actual 1929 | | | | | 1 |
| Trade Class No. 10. | | 2 | | | | | | | | | 2 |
| John P. Croes Opt. Co. Rochester, N.Y. | | 3 | $58,000.00 | | $58,691.00 | $61,037.00 | $15,679.06 | $15,060.00 | $400 5% | | 3 |
| | | 4 | | | | | | | | | 4 |
| | | 5 | | | | | | | | | 5 |
| Trade Class No. 9. | | 6 | | | | | | | | | 6 |
| Andrews and Johnston Rochester, N.Y. | | 7 | 1,450.00 | | 1,266.00 | 2,295.00 | 278.16 | 360.00 | 101.84 | | 7 |
| Harold T. Parse Rochester, N.Y. | | 8 | 4,500.00 | | 3,902.00 | 3,814.00 | 947.27 | 1,165.00 | 217.73 | | 8 |
| Geo. P. Elliott. Rochester, N.Y. | | 9 | 1,300.00 | | 1,580.00 | 1,239.00 | 241.73 | 340.00 | 98.27 | | 9 |
| H. M. Kiles. Rochester, N.Y. | | 10 | 4,500.00 | | 5,340.00 | 4,529.00 | 1,855.05 | 1,685.00 | 170.05 | | 10 |
| Chas. H. Smith. Rochester, N.Y. | | 11 | - | | - | 592.00 | - | - | - | | 11 |
| N. P. Crowell. Rochester, N.Y. | | 12 | 16,000.00 | | 14,784.00 | 23,911.00 | 1,956.89 | 4,160.00 | 2,207.11 | | 12 |
| Ralph A. Allen. Rochester, N.Y. | | 13 | 7,600.00 | | 7,985.00 | 8,295.00 | 1,990.93 | 2,030.00 | 39.07 | | 13 |
| H. F. Ashley. Rochester, N.Y. | | 14 | 1,600.00 | | 1,275.00 | 745.00 | - | 420.00 | 420.00 | | 14 |
| | | 15 | | | | | | | | | 15 |
| | | 16 | | | | | | | | | 16 |
| | | 17 | | | | | | | | | 17 |
| | | 18 | | | | | | | | | 18 |
| | | 19 | | | | | | | | | 19 |
| Total Trade Class No. 9. | | 20 | $39,150.00 | | $36,114.00 | $47,013.00 | $7,270.01 | $10,160.00 | $2,909.97 | | 20 |
| | | 21 | | | | | | | | | 21 |
| | | 22 | | | | | | | | | 22 |
| | | 23 | | | | | | | | | 23 |
| Trade Class No. 8. | | 24 | | | | | | | | | 24 |
| J. H. Raithel. Rochester, N.Y. | | 25 | | | | | | | | | 25 |
| | | 26 | | | | | | | | | 26 |
| | | 27 | | | | | | | | | 27 |
| Others Not Analyzed. | | 28 | | | | | 2.50 | - | 2.50 | | 28 |
| Total Trade Class No. 8. | | 29 | | | | | 2.50 | - | 2.50 | | 29 |
| | | 30 | | | | | | | | | 30 |
| | | 31 | | | | | | | | | 31 |
| Other Trade Classes. | | 32 | | | $399.00 | | 15.97 | - | 15.97 | | 32 |
| | | 33 | | | | | | | | | 33 |
| | | 34 | | | | | 4.03 | - | 4.03 | | 34 |
| Grand Total District No. X. | | 35 | $97,150.00 | | $91,124.00 | $111,050.00 | $21,971.59 | $25,260.00 | $3,288.41 | | 35 |

**FORM 910 A**

**Record used for Sales of each Product Class and each District, Indicating a Selected List of Customers for each Product.**

FIGURE 20

product M, district X. We have distinctive lists of customers for each product within the one district because the same customer

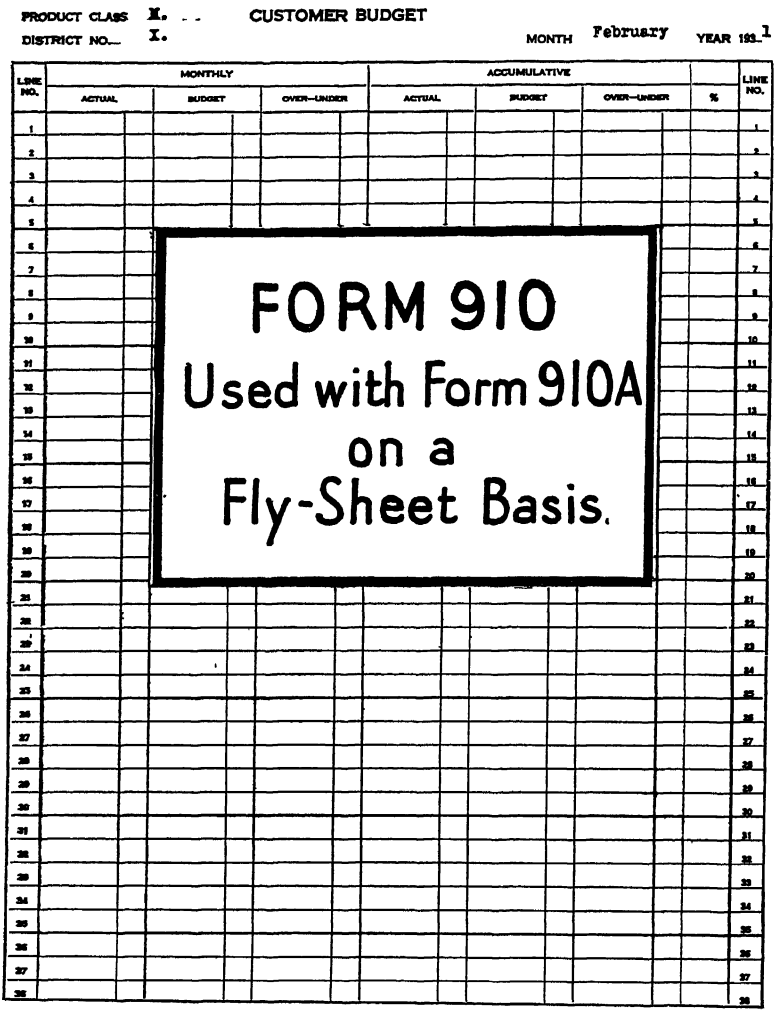


FIGURE 21

does not always buy all of the products. We show the total 1931 budget, the actual for 1930 and 1929 on the January sheet only, as the spaces are available on account of their being no cumulative

record for January. The open column is used as a memo column. It is very handy to use when establishing the 1932 budget figures.

You may readily observe that the shortage of $3,288 in this district was practically caused by one customer, line number twelve, which represented $2,203 of the total shortage. Long-time searching for trouble through many thousand customer records is eliminated through the customer budget record.

Figure twenty-one shows the fly sheet that is used with the customer record. The use of a fly sheet eliminates the re-typing of the description each month, saves material and also creates compactness by being able to use both sides of the sheet, such as, for February and March.

Figure twenty-two shows the record giving the sales of today, to date for the month, and the budget for the month. The actual date is shown at the top followed by the number of business days in the month. For instance, if it is the tenth of the month, it may only be the eighth business day.

As an example, the budget for the month is $1,000,000. The sales to date are $500,000, and the balance required would therefore be $500,000. The balance required, divided by the number of remaining business days in the month, gives us the remaining daily requirement. If the remaining business days were ten, the average daily requirement would be $50,000. If we were running only $40,000 a day, we would then know that it was necessary to step on it or else we would be short approximately $100,000 at the end of the month.

The same is true with the individual class of product. The remaining balance might be $30,000, or an average requirement for each of the remaining ten days of $3,000. If the divisional managers sales were only averaging $2,000 per day, he would also know that he must step on it. We watch the sales performance daily and thereby have the opportunity to make corrections before the end of the month.

Figure twenty-three illustrates what we think is one of our best forms and many have adopted it. It gives the sales in units indicating the actual, budget, over and under, both monthly and cumulative, ending balance orders, if any, orders received cumulative, current year, previous year, production schedule, actual, budget, over and under for the month and accumulated and finished stock on hand. This is where the sales and production people

coordinate. Without such correlation and coordination, a budget will be unsuccessful.

Mr _____ Date _____

Day of _____ Business Days

DAILY SALES REPORT

| CODE | CLASS | Description | CURRENT MONTH TO-DAY | TO DATE | BUDGET |
|---|---|---|---|---|---|
| 01 | A 1 | Gold Filled | | | |
| 02 | A 2 | Cases | | | |
| 03 | A 3 | Zylonite | | | |
| 04 | A 4 | Solid Gold | | | |
| Total Frame | | | | | |
| 11 | B 1 | Single Vision | | | |
| 12 | B 2 | Double Vision | | | |
| 13 | B 3 | Misc. Lenses | | | |
| Total Lens | | | | | |
| 21 | C | Opt. Mach. | | | |
| 61 | G | Binoc. & Tele. | | | |
| 71 | H 1 | Ophth. Inst. | | | |
| 81 | I | Novelties | | | |
| Total Other Ophth. | | | | | |
| TOTAL OPHTHALMIC | | | | | |
| 31 | D 1 | Micro. | | | |
| 33 | D 2 | Meas. Insts. | | | |
| 41 | E 1 | Proj. App | | | |
| 42 | E 2 | Photo. Micro. | | | |
| 43 | E 3 | Mirrors | | | |
| 51 | F | Photographic | | | |
| 98 | L | Misc. | | | |
| TOTAL INSTRUMENTS | | | | | |
| 91 | J | Military | | | |
| Grand Total | | | | | |

SALES TO DATE SAME MONTH LAST YEAR

FRAME
LENS
OTHER OPHTH.
INST.
MILITARY
TOTAL

BALANCE REQUIRED ( Days) _____

AVERAGE DAILY REQUIREMENT _____

EF Dept.

FORM 498-I
Daily Record of Sales for
19 Main Product Classifications

FIGURE 22

If the production manager sees that his production is down, and that the sales are also down, he is not going after the production division on a particular unit. But if the production is down and

MONTH_____ YEAR_____ CLASS_____

| DESCRIPTION | LINE No | SALES MONTHLY | | | SALES ACCUMULATIVE | | | ENDING BAL. ORDERS | ORDERS RECEIVED ACCUM. | | PRODUCTION SCHEDULE | | | | FINISHED STOCK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ACTUAL | BUDGET | OVER OR UNDER | ACTUAL | BUDGET | OVER OR UNDER | | CURRENT YEAR | PREVIOUS YEAR | ACTUAL FOR MONTH | BUDGET FOR MONTH | OVER OR UNDER FOR MONTH | OVER OR UNDER ACCUMULATIVE | |
| REGULAR WHITE | 1 | | | | | | | | | | | | | | |
| DOUBLES | 2 | | | | | | | | | | | | | | |
| PERISCOPIC | 3 | | | | | | | | | | | | | | |
| MINISCUS—SEMI | 4 | | | | | | | | | | | | | | |
| " UNCUT—EDGED | 5 | | | | | | | | | | | | | | |
| FLAT CYL'S.—SEMI | 6 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 7 | | | | | | | | | | | | | | |
| TORIC CYL'S.—SEMI | 8 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 9 | | | | | | | | | | | | | | |
| WAFERS | 10 | | | | | | | | | | | | | | |
| MOULDED BLANKS | 11 | | | | | | | | | | | | | | |
| | 12 | | | | | | | | | | | | | | |
| | 13 | | | | | | | | | | | | | | |
| REGULAR CROOKES | 14 | | | | | | | | | | | | | | |
| MINISCUS—SEMI | 15 | | | | | | | | | | | | | | |
| " UNCUT—EDGED | 16 | | | | | | | | | | | | | | |
| TORIC CYL'S.—SEMI | 17 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 18 | | | | | | | | | | | | | | |
| MOULDED BLANKS | 19 | | | | | | | | | | | | | | |
| | 20 | | | | | | | | | | | | | | |
| | 21 | | | | | | | | | | | | | | |
| REGULAR SOFTLITE | 22 | | | | | | | | | | | | | | |
| MINISCUS—SEMI | 23 | | | | | | | | | | | | | | |
| " UNCUT—EDGED | 24 | | | | | | | | | | | | | | |
| TORIC CYL'S.—SEMI | 25 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 26 | | | | | | | | | | | | | | |
| MOULDED BLANKS | 27 | | | | | | | | | | | | | | |
| | 28 | | | | | | | | | | | | | | |
| | 29 | | | | | | | | | | | | | | |
| ORTHOSON WHITE | 30 | | | | | | | | | | | | | | |
| MINISCUS—SEMI | 31 | | | | | | | | | | | | | | |
| " UNCUT—EDGED | 32 | | | | | | | | | | | | | | |
| TORIC CYL'S.—SEMI | 33 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 34 | | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | | |
| | 36 | | | | | | | | | | | | | | |
| ORTHOSON SOFT-LITE | 37 | | | | | | | | | | | | | | |
| MINISCUS—SEMI | 38 | | | | | | | | | | | | | | |
| " UNCUT—EDGED | 39 | | | | | | | | | | | | | | |
| TORIC CYL'S.—SEMI | 40 | | | | | | | | | | | | | | |
| " " UNCUT—EDGED | 41 | | | | | | | | | | | | | | |
| | 42 | | | | | | | | | | | | | | |
| | 43 | | | | | | | | | | | | | | |
| FORGINGS (Typical) | 44 | | | | | | | | | | | | | | |
| | 45 | | | | | | | | | | | | | | |
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Form 989-1

## FORM 989-1

Record of
Total Units Sold,
Ending Balance Orders,
Orders Received,
Production & Finished Stock

FIGURE 23

sales are up, it is up to him to balance operations, i. e., cut on one unit and increase on the other. In regard to turnover, it continually shows the sales in relation to finished stock.

We have adopted a new feature in controlling our finished stocks, which developed through our stabilization of employment. Rather than deal with a set minimum stock, we have a seasonal minimum established for each month. We know, for instance, that at the low point of sales we should have four or five months' stock and at the high point of sales, our stocks should be down to two months'. As soon as we pre-determine our standard seasonal trend of sales, we apply such trend standards and pre-determine our seasonal minimum stocks. No one will fight about stocks being over the two months' minimum any more. They are now watching the seasonal minimum.

Figure twenty-four illustrates how far we go in analyzing returns. Returns are a bugbear in any business, and in our own case we wanted to try to reduce them. We established a tabulating code and punched a special card for each credit. We were then well prepared with facts to locate our trouble whether it be in the sales department, factory inspection, factory warehouse and production, customer's fault, branch office's, etc. We tabulate these various reasons for returns in both dollars and number of jobs involved, by class of product ,by district, and by trade. We were actually able, through this source of information and continual follow-up, to cut our returns almost in half. You would be surprised at the interest that is taken by our various divisions in not wanting to have such returns show up against them, and trying, of course, at all times to reduce returns.

Figure twenty-five is a sort of trick form, in that we wanted to dispose of such items and couldn't get the Sales Department to do their share, as they said there was a lack of current information available on such stock. Therefore, we put out a form that had the twelve months on it, but did not tell the Sales Department why we had changed from the former monthly record. At the end of January we gave them the record of what they had sold of the stock available January first. At the end of February, we went to their office and asked to have the sheet back in order that we could enter the February figures. Over half of them couldn't find the record, as it had been pigeon-holed. At the end of March, they all had their sheet ready for entering the March figures, and the

record has now become active and is producing orders.

Figure twenty-six is the standard and only form used for all

CODES USED FOR THE ANALYSIS OF REASONS FOR RETURNED MERCHANDISE

00 SALES DEPARTMENT:

01 Sales Policy (Good Will)
02 On Consignment (Memo)
03 On Consignment (Regular)
05 To Apply on New Purchase (Active)
10 Misinterpretation of Order
11 Sales Policy (Obsolete)
12 Distributors Samples

20 FACTORY INSPECTION:

21 Not According to Specifications (Active)
22 Not According to Specifications (Obsolete)
23 Defective (Active)
24 Defective (Obsolete)
25 Defective (Replace even Exchange)

30 FACTORY WAREHOUSE AND PRODUCTION:

31 Damaged in Transit (Active)
32 Damaged in Transit (Obsolete)
33 Order Cancelled While Enroute (Sent too Late)
34 Error in Entry
35 Error in Filling
36 Duplicate Order

40 CUSTOMER'S FAULT:

41 Refused C. O. D.
42 Damaged by Customer (Active)
43 Damaged by Customer (Obsolete)
44 Error in Ordering
45 Over Stocked
46 Financial
47 Our Standard Not Acceptable (Active)
48 Our Standard Not Acceptable (Obsolete)

50 CONVENTIONS AND SALESMAN'S SAMPLES:

51 On Memo

60 BRANCH OFFICES:

61 Stock Transfer Needed for Customer's Order
62 Surplus Stock (Active)
63 Surplus Stock (Obsolete)
64 Damaged in Transit (Active)
65 Damaged in Transit (Obsolete)
66 Order Cancelled While Enroute (Sent too Late)
67 Error in Entry
68 Error in Filling
69 Duplicate Order

FIGURE 24

financial items. It provides for the total budget for the year, and the actual, budget, over and under, both monthly and cumulative.

The description column is wide enough to describe any account or class of product.

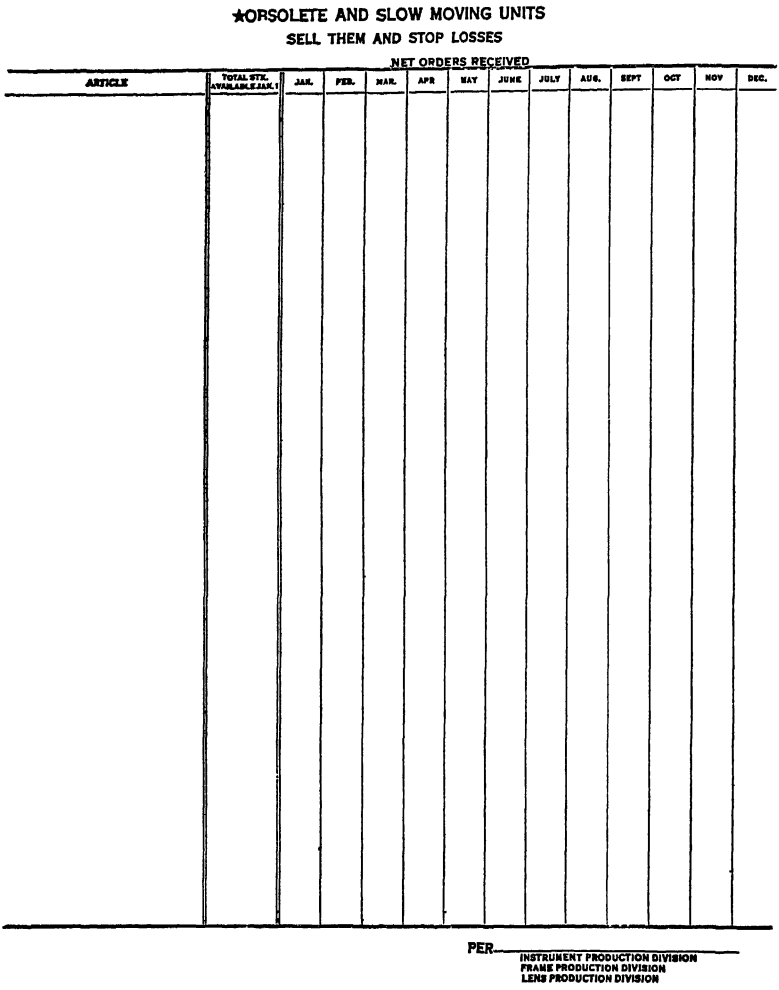


FIGURE 25

Figure twenty-seven is a fly sheet and the line numbers control items without repeating description. It is typed on both sides for inside monthly use and on one side only when sent outside.

Figure twenty-eight shows a form that spreads before the management the entire budget for the year. It is typed from our

SUBJECT: _____ MONTH: _____ YEAR: _____

| DESCRIPTION | LINE NO | BUDGET TOTAL | MONTHLY ACTUAL | MONTHLY BUDGET | MONTHLY OVER OR UNDER | ACCUMULATIVE ACTUAL | ACCUMULATIVE BUDGET | ACCUMULATIVE OVER OR UNDER | S | LINE NO. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | 1 |
| | 2 | | | | | | | | | 2 |
| | 3 | | | | | | | | | 3 |
| | 4 | | | | | | | | | 4 |
| | 5 | | | | | | | | | 5 |
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**FORM 612**

General Financial Record used for Sales, Expenditures, Costs, Inventories, Expenses, Profit and Loss, Cash, etc.

FIGURE 26

master work sheets. Although we previously did not make a copy of our work sheets, we discovered that management found it very helpful to continually have the advance plans placed before them

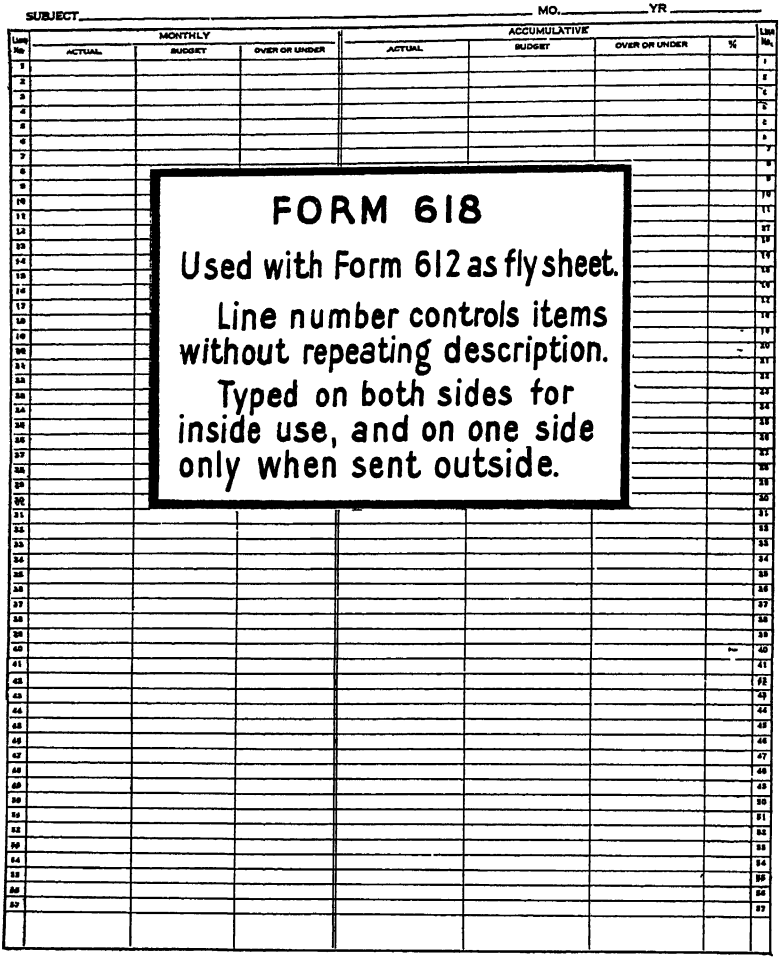


FIGURE 27

so they would know at all times where they were headed. Of course, the record of the actual performance against the budget is the more important one.

SUBJECT _____ YEAR _____

| DESCRIPTION | Line No. | BUDGET | JANUARY | FEBRUARY MO | FEBRUARY ACC. | MARCH MO | MARCH ACC | APRIL MO | APRIL ACC | MAY MO | MAY ACC | JUNE MO. | JUNE ACC. | Line No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | | | | | 1 |
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**FORM 842**

Used for Presentation of Entire Financial Budget for the Year, Covering Sales, Direct Material and Labor, Inventory, etc.

Last Six Months Form entirely similar.

FIGURE 28

SUBJECT: CASH BUDGET MONTH: JUNE YEAR: 1931

| DESCRIPTION | Line No. | BUDGET TOTAL | MONTHLY ACTUAL | MONTHLY BUDGET | MONTHLY Increase or Decrease | ACCUMULATIVE ACTUAL | ACCUMULATIVE BUDGET | ACCUMULATIVE Increase or Decrease | % | Line No. |
|---|---|---|---|---|---|---|---|---|---|---|
| RECEIPTS | 1 | | | | | | | | | 1 |
| Gross - Collections from Shipments | 2 | | | | | | | | | 2 |
| Less - Cash Discount Allowed | 3 | | | | | | | | | 3 |
| Net - Collections from Shipments | 4 | | | | | | | | | 4 |
| Rentals | 5 | | | | | | | | | 5 |
| Interest Received - Bank and Notes | 6 | | | | | | | | | 6 |
| Dividends Received | 7 | | | | | | | | | 7 |
| Cash Discount Taken | 8 | | | | | | | | | 8 |
| Preferred Stock Subscription | 9 | | | | | | | | | 9 |
| Collected on Notes | 10 | | | | | | | | | 10 |
| Miscellaneous Receipts | 11 | | | | | | | | | 11 |
| | 12 | | | | | | | | | 12 |
| GRAND TOTAL RECEIPTS | 13 | | | | | | | | | 13 |
| | 14 | | | | | | | | | 14 |
| DISBURSEMENTS | 15 | | | | | | | | | 15 |
| Direct Material | 16 | | | | | | | | | 16 |
| Direct Labor | 17 | | | | | | | | | 17 |
| Indirect Labor | 18 | | | | | | | | | 18 |
| Indirect Expense-General (Mail & Labor) | 19 | | | | | | | | | 19 |
| Indirect Expense-Power-Heat-Light & Water | 20 | | | | | | | | | 20 |
| Indirect Expense-Insurance and Taxes | 21 | | | | | | | | | 21 |
| Administrative Salaries - General | 22 | | | | | | | | | 22 |
| Administrative Salaries - Executive | 23 | | | | | | | | | 23 |
| Administrative Expenses | 24 | | | | | | | | | 24 |
| Selling Salaries | 25 | | | | | | | | | 25 |
| Selling Expense-General | 26 | | | | | | | | | 26 |
| Selling Expense-Royalties | 27 | | | | | | | | | 27 |
| Branch Transfers (Selling Exp. & Salaries) | 28 | | | | | | | | | 28 |
| Bonus | 29 | | | | | | | | | 29 |
| Miscellaneous Disbursements | 30 | | | | | | | | | 30 |
| | 31 | | | | | | | | | 31 |
| Total Operating Disbursements | 32 | | | | | | | | | 32 |
| | 33 | | | | | | | | | 33 |
| Security Investments | 34 | | | | | | | | | 34 |
| Sinking Fund Mortgage Bonds | 35 | | | | | | | | | 35 |
| Interest Mortgage | 36 | | | | | | | | | 36 |
| Dividends - Preferred Stock | 37 | | | | | | | | | 37 |
| Dividends - Common Stock | 38 | | | | | | | | | 38 |
| Advances to Distributors | 39 | | | | | | | | | 39 |
| Plant Additions | 40 | | | | | | | | | 40 |
| Federal and State Taxes | 41 | | | | | | | | | 41 |
| Interest Paid | 42 | | | | | | | | | 42 |
| | 43 | | | | | | | | | 43 |
| General Disbursements | 44 | | | | | | | | | 44 |
| | 45 | | | | | | | | | 45 |
| GRAND TOTAL DISBURSEMENTS | 46 | | | | | | | | | 46 |
| GRAND TOTAL RECEIPTS | 47 | | | | | | | | | 47 |
| Net Increase or Decrease | 48 | | | | | | | | | 48 |
| Cash Beginning | 49 | | | | | | | | | 49 |
| Total Balance Ending | 50 | | | | | | | | | 50 |
| | 51 | | | | | | | | | 51 |
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Sample of Typical Set Up of Cash Budget as applied to this Form.

FIGURE 29

I am simply showing you this cash budget to indicate how the financial form (figure twenty-nine) can be used for almost any set-up. You will note the various receipts, such as collections, interest, dividends, etc., and then the total receipts. Disbursements follow, such as direct and indirect labor, power, heat, insurance, taxes, etc., and then total operating disbursements. General disbursements follow, such as dividends, interest, etc., to total general disbursements, and then grand total disbursements. You then bring down the receipts and disbursements and the difference is the net increase or decrease in cash, plus the cash at the beginning, giving you the balance ending.

I have told you a lot about the information we create and use. With our unusual variety we must also have some method of getting our reports out quickly and at a low cost. Figure thirty is a typical tabulating form which is used for the costing of sales.

We are handling about 800 invoices a day, with about ten items on an invoice, which is 8,000 items a day or 200,000 a month. Naturally we sell the same product to a good many customers during one day and perhaps we sell to the same or other customers the same product the next day. To cost every invoice would be very expensive. Therefore, through tabulation, instead of repeatedly costing one unit throughout each day of the month, we cost the entire quantity sold at one time at the end of the month. The form shows you the main and sub-class, the catalogue number, the quantity per catalogue number, and the total dollars received by catalogue number, sub-class, and grand total ($7,203.02). All sorting and the entire tabulating is performed automatically.

Our Tabulating Department tie their sales dollars in daily to the accounts receivable control and run the daily sales record by class of product. At the end of the month, the first report run is the total dollars of sales by the nineteen classes, then by state, and then by district, before we go into any unit information. We then run the cost of sales report by unit and send it to the Factory Accounting Department. They then apply their costs in the elements of material, labor, and overhead. It might be mentioned that we obtain a genuine check of unit quantities and dollar values at this point, as the Cost Department can readily tell that instead of one unit the quantity should be ten, as the costing would indicate the variance against selling price. We are then quite sure that our

unit quantities have been punched correctly before tabulating further unit information.

The costing of sales by machine is giving us our monthly inventories and consequent profit and loss statements, which had

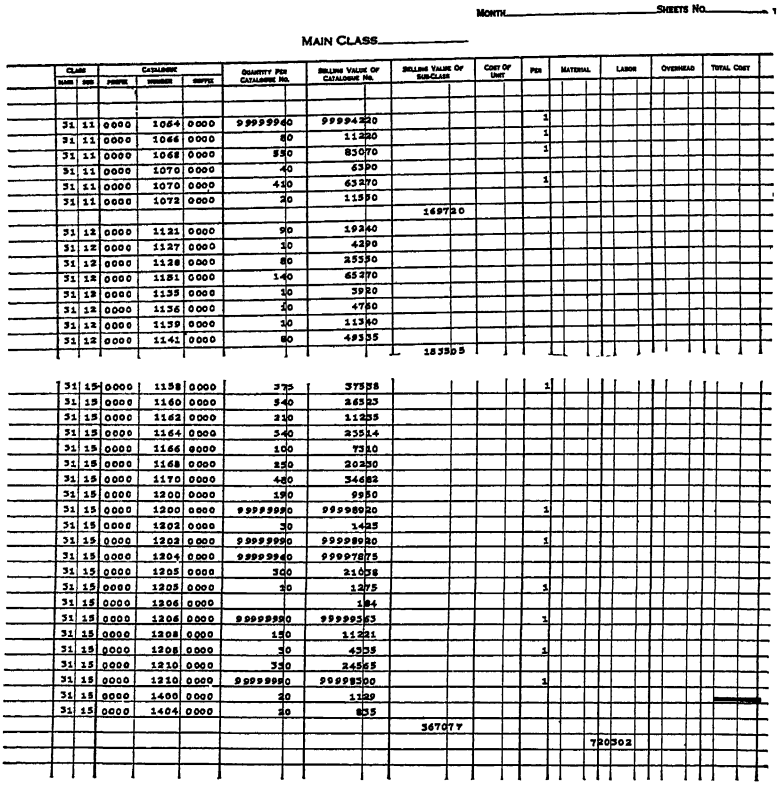



FIGURE 30

heretofore not been available before. We had the cost of sales for the month of May completed on June fifth, 1931. I believe you will agree that we are not at all slow, considering the various units and quantities involved.

Figure thirty-one shows the units, broken down to district both in quantity and dollar value, and total selling value for the main class.

The customer purchases are tabulated on this form (figure thirty-two) which indicates the customer; the trade he is in, or whether he is a jobber, retailer, etc; what he purchased of main

UNIT SALES BY TERRITORY

CLASS

| INSTRUMENT | CLASS MAIN | CLASS SUB | CATALOGUE PREFIX | CATALOGUE NUMBER | CATALOGUE SUFFIX | UNIT | DISTRICT NO | QUANTITY | TOTAL QUANTITY | SELLING VALUE | TOTAL SELLING VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 91 | 11 | 0000 | 1064 | 0000 | 1 | 11 | 10 | | 15 50 | |
| | 91 | 11 | 0000 | 1066 | 0000 | 1 | 11 | 20 | | 27 20 | |
| | 91 | 11 | 0000 | 1068 | 0000 | 1 | 11 | 40 | | 85 50 | |
| | 91 | 11 | 0000 | 1070 | 0000 | 1 | 11 | 50 | | 75 60 | |
| | 91 | 12 | 0000 | 1121 | 0000 | | 11 | 20 | | 49 50 | |
| | 91 | 12 | 0000 | 1128 | 0000 | | 11 | 10 | | 35 10 | |
| | 91 | 12 | 0000 | 1151 | 0000 | | 11 | 20 | | 78 00 | |
| | 91 | 12 | 0000 | 1141 | 0000 | | 11 | 99999990 | | 99993790 | |
| | 91 | 15 | 0000 | | | | 11 | | | 19 | |
| | 91 | 15 | 0000 | 1100 | 0000 | | 11 | 260 | | 4317 | |
| | 91 | 15 | 0000 | 1101 | 0000 | | 11 | 20 | | 398 | |
| | 91 | 15 | 0000 | 1302 | 0000 | | 11 | 120 | | 2510 | |
| | 91 | 11 | 0000 | 1064 | 0000 | 1 | 13 | 60 | | 93 80 | |
| | 91 | 11 | 0000 | 1068 | 0000 | 1 | 13 | 80 | | 12690 | |
| | 91 | 11 | 0000 | 1070 | 0000 | 1 | 13 | 70 | | 11070 | |
| | 91 | 12 | 0000 | 1121 | 0000 | | 13 | 20 | | 3500 | |
| | 91 | 12 | 0000 | 1128 | 0000 | | 13 | 20 | | 5650 | |
| | 91 | 12 | 0000 | 1151 | 0000 | | 13 | 10 | | 3500 | |
| | | | | | | | | | 260 | | 46990 |
| | 91 | 11 | 0000 | 1068 | 0000 | 1 | 14 | 10 | | 1620 | |
| | 91 | 11 | 0000 | 1070 | 0000 | 1 | 14 | 10 | | 1620 | |
| | 91 | 12 | 0000 | 1127 | 0000 | | 14 | 10 | | 3120 | |
| | 91 | 15 | 0000 | 1104 | 0000 | | 14 | 200 | | 2186 | |
| | 91 | 15 | 0000 | 1106 | 0000 | | 14 | 20 | | 525 | |
| | 91 | 15 | 0000 | 1108 | 0000 | | 14 | 10 | | 358 | |
| | 91 | 15 | 0000 | 1110 | 0000 | 1 | 14 | | | | |
| | 91 | 15 | 0000 | 1114 | 0000 | 1 | 14 | 10 | | 495 | |
| | | | | | | | | | 170 | | 9502 |
| | 91 | 11 | 0000 | 1066 | 0000 | 1 | 22 | 20 | | 3060 | |
| | 91 | 11 | 0000 | 1068 | 0000 | 1 | 22 | 100 | | 14220 | |
| | 91 | 11 | 0000 | 1070 | 0000 | 1 | 22 | 50 | | 8370 | |
| | 91 | 12 | 0000 | 1121 | 0000 | | 22 | 10 | | 2540 | |
| | 91 | 12 | 0000 | 1128 | 0000 | | 22 | 10 | | 1925 | |
| | 91 | 12 | 0000 | 1151 | 0000 | | 22 | 30 | | 14560 | |
| | 91 | 12 | 0000 | 1159 | 0000 | | 22 | 10 | | 9720 | |
| | | | | | | | | | 250 | | 55195 |

FIGURE 31

product class number one, two, three and the total that he purchased of that group of products; what he purchased of products eleven and twelve, and the total of that group, and finally the grand total purchased. All of these totals are automatically obtained from the machine.

Following the customer purchases in dollars, they are now presented on this form (figure thirty-three) by units, by value of the unit, and total value of the units by customer. You will note that where the invoice number appears the item is special as designated by a code catalogue number 8888.

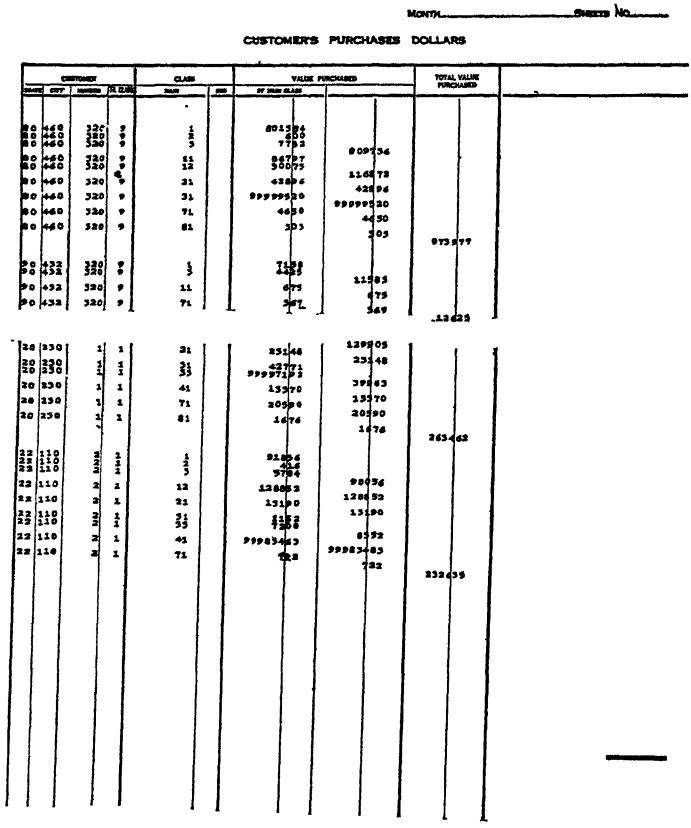



FIGURE 32

Figure thirty-four shows one of our best and pet tabulating records. Rather than go through all of our customers' records to find where a unit has been sold, we reverse our entire tabulating and show the unit first and then the various customers who purchased the unit, their trade, the ledger control, the discount, the unit, each, pair, dozen, etc., the quantity each one bought, the

money each one paid, and the total money received from the sale of that product for the month.

CUSTOMERS INSTRUMENT PURCHASES

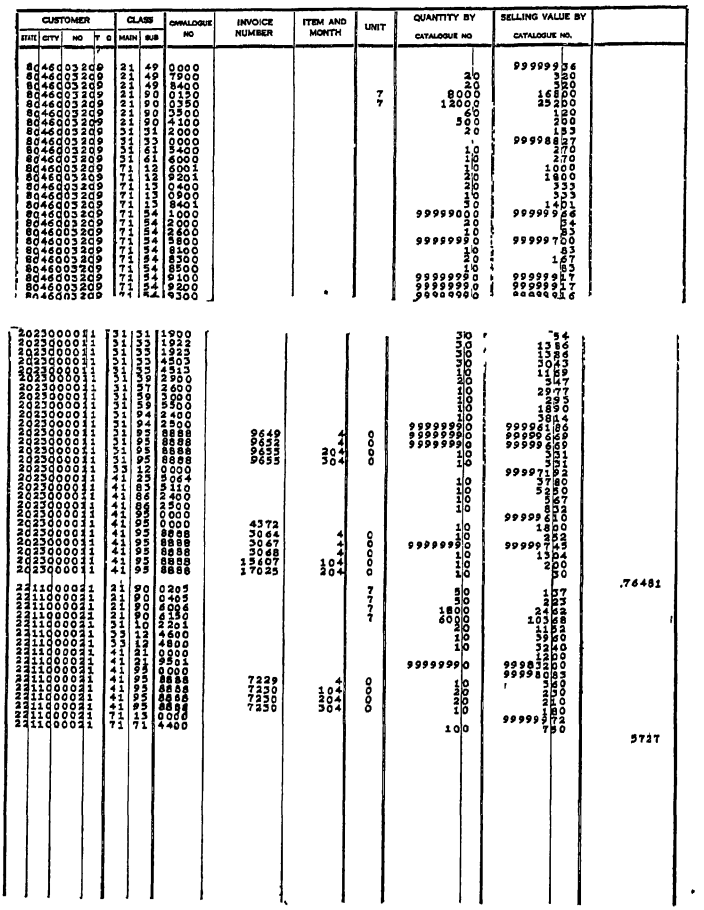
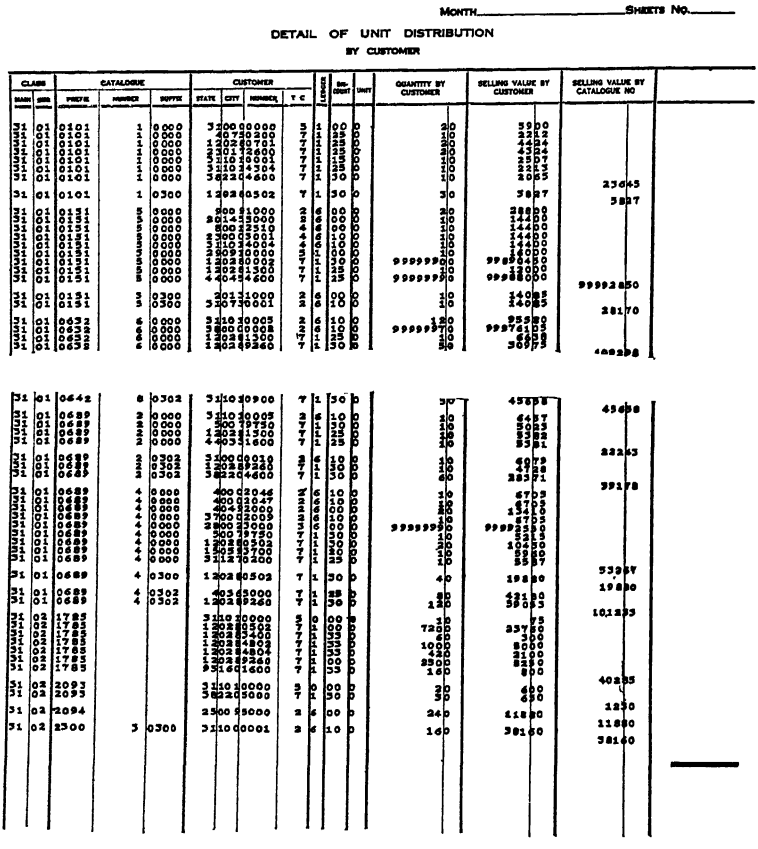



FIGURE 33

Think for a moment what this record can do for you. It will show you that, for instance, you are only selling the unit to ten customers. Why aren't you selling it to 100 customers? It is possibly going to show you that you are selling one customer ten

units, another twenty, another thirty, and another 200 units. Why aren't you selling all of them at least 200? There are many other analyses which can readily be obtained from this record. We are driving all of the time towards hitting a better absorption of that potential market.


MONTH_____ SHEETS NO._____

DETAIL OF UNIT DISTRIBUTION

BY CUSTOMER

| CLASS | | CATALOGUE | | | CUSTOMER | | | | | | QUANTITY BY CUSTOMER | SELLING VALUE BY CUSTOMER | SELLING VALUE BY CATALOGUE NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PREFIX | NUMBER | SUFFIX | STATE | CITY | NUMBER | T C | | | | | |
| 31 | 01 | 0101 | 1 | 0000 | 31 | 10 | 00900 | 7 | 1 | 90 | 90 | 3990 | |
| 31 | 01 | 0101 | 1 | 0000 | 31 | 10 | 00730 | 7 | 1 | 22 | 22 | 2222 | |
| 31 | 01 | 0101 | 1 | 0000 | 11 | 02 | 00701 | 7 | 1 | 24 | 24 | 2424 | |
| 31 | 01 | 0101 | 1 | 0000 | 31 | 01 | 72600 | 7 | 1 | 24 | 24 | 2424 | |
| 31 | 01 | 0101 | 1 | 0000 | 43 | 10 | 10000 | 7 | 1 | 25 | 25 | 2525 | |
| 31 | 01 | 0101 | 1 | 0000 | 31 | 10 | 34306 | 7 | 1 | 23 | 23 | 2323 | |
| 31 | 01 | 0101 | 1 | 0000 | 34 | 02 | 04600 | 7 | 1 | 30 | 30 | 3095 | |
| | | | | | | | | | | | | | 23643 |
| 31 | 01 | 0101 | 1 | 0300 | 11 | 02 | 00502 | 7 | 1 | 30 | 0 | 3827 | 3827 |
| 31 | 01 | 0131 | 13 | 0000 | 2 | 00 | 31000 | 2 | 6 | 00 | 0 | 2880 | |
| 31 | 01 | 0131 | 5 | 0000 | 20 | 14 | 30200 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 2 | 00 | 23510 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 31 | 10 | 30014 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 31 | 10 | 34004 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 31 | 10 | 30000 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 31 | 10 | 30000 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0131 | 5 | 0000 | 11 | 02 | 08000 | 7 | 1 | 25 | 0 | 9999999 | 9999 |
| 31 | 01 | 0131 | 5 | 0000 | 11 | 02 | 01500 | 7 | 1 | 25 | 0 | 3200 | |
| 31 | 01 | 0151 | 8 | 0000 | 4 | 04 | 34600 | 7 | 1 | 25 | 0 | 9999999 | 9998 |
| | | | | | | | | | | | | | 99992850 |
| 31 | 01 | 0151 | 13 | 0300 | 2 | 00 | 31000 | 2 | 6 | 00 | 0 | 1440 | |
| 31 | 01 | 0151 | 13 | 0300 | 31 | 10 | 30011 | 2 | 6 | 00 | 0 | 1440 | |
| | | | | | | | | | | | | | 28170 |
| 31 | 01 | 0632 | 6 | 0000 | 31 | 10 | 30005 | 2 | 6 | 10 | 0 | 2580 | |
| 31 | 01 | 0632 | 6 | 0000 | 31 | 10 | 00091 | 7 | 1 | 00 | 0 | 9999999 | 9997 |
| 31 | 01 | 0632 | 6 | 0000 | 11 | 02 | 01300 | 7 | 1 | 25 | 0 | 6 | |
| 31 | 01 | 0638 | 6 | 0000 | 11 | 02 | 09260 | 7 | 1 | 30 | 0 | 30 | 3097 |
| | | | | | | | | | | | | | 4002 |
| 31 | 01 | 0642 | 8 | 0302 | 31 | 10 | 00900 | 7 | 1 | 30 | 0 | 30 | 4585 |
| | | | | | | | | | | | | | 45858 |
| 31 | 01 | 0689 | 2 | 0000 | 31 | 10 | 30005 | 2 | 6 | 10 | 0 | 10 | 6417 |
| 31 | 01 | 0689 | 2 | 0000 | 31 | 00 | 79730 | 2 | 6 | 10 | 0 | 20 | 3203 |
| 31 | 01 | 0689 | 2 | 0000 | 11 | 02 | 01500 | 7 | 1 | 25 | 0 | 25 | 3382 |
| 31 | 01 | 0689 | 2 | 0000 | 43 | 10 | 31600 | 7 | 1 | 25 | 0 | 25 | 3591 |
| | | | | | | | | | | | | | 22243 |
| 31 | 01 | 0689 | 2 | 0302 | 31 | 00 | 00010 | 2 | 6 | 10 | 0 | 10 | 4278 |
| 31 | 01 | 0689 | 2 | 0302 | 11 | 02 | 09260 | 7 | 1 | 30 | 0 | 20 | 2528 |
| 31 | 01 | 0689 | 2 | 0302 | 31 | 10 | 04600 | 7 | 1 | 30 | 0 | 60 | 28371 |
| | | | | | | | | | | | | | 39178 |
| 31 | 01 | 0689 | 4 | 0000 | 4 | 00 | 02046 | 2 | 6 | 10 | 0 | 10 | 6703 |
| 31 | 01 | 0689 | 4 | 0000 | 4 | 00 | 02047 | 2 | 6 | 10 | 0 | 20 | 13406 |
| 31 | 01 | 0689 | 4 | 0000 | 4 | 04 | 32000 | 2 | 6 | 10 | 0 | 10 | 6703 |
| 31 | 01 | 0689 | 4 | 0000 | 37 | 00 | 03009 | 2 | 6 | 10 | 0 | 10 | 6703 |
| 31 | 01 | 0689 | 4 | 0000 | 31 | 00 | 22000 | 2 | 6 | 10 | 0 | 9999999 | 9999 |
| 31 | 01 | 0689 | 4 | 0000 | 1 | 00 | 37250 | 7 | 1 | 25 | 0 | 1 | 3345 |
| 31 | 01 | 0689 | 4 | 0000 | 11 | 02 | 05200 | 7 | 1 | 25 | 0 | 1 | 3345 |
| 31 | 01 | 0689 | 4 | 0000 | 11 | 02 | 04700 | 7 | 1 | 25 | 0 | 10 | 13380 |
| 31 | 01 | 0689 | 4 | 0000 | 31 | 12 | 00200 | 7 | 1 | 25 | 0 | 10 | 13380 |
| | | | | | | | | | | | | | 53357 |
| 31 | 01 | 0689 | 4 | 0300 | 11 | 02 | 00502 | 7 | 1 | 30 | 0 | 40 | 19830 |
| | | | | | | | | | | | | | 19830 |
| 31 | 01 | 0689 | 4 | 0302 | 4 | 03 | 03000 | 7 | 1 | 25 | 0 | 80 | 42190 |
| 31 | 01 | 0689 | 4 | 0302 | 11 | 02 | 09260 | 7 | 1 | 30 | 0 | 120 | 59053 |
| | | | | | | | | | | | | | 101243 |
| 31 | 02 | 1785 | | | 31 | 10 | 00000 | 5 | 0 | 00 | 0 | 10 | 475 |
| 31 | 02 | 1785 | | | 31 | 02 | 00150 | 7 | 1 | 00 | 0 | 750 | 35625 |
| 31 | 02 | 1785 | | | 11 | 02 | 04200 | 7 | 1 | 00 | 0 | 2 | 95 |
| 31 | 02 | 1785 | | | 11 | 02 | 04202 | 7 | 1 | 00 | 0 | 100 | 4750 |
| 31 | 02 | 1785 | | | 11 | 02 | 04204 | 7 | 1 | 00 | 0 | 42 | 1995 |
| 31 | 02 | 1785 | | | 11 | 02 | 08200 | 7 | 1 | 00 | 0 | 250 | 11875 |
| 31 | 02 | 1785 | | | 31 | 14 | 01600 | 7 | 1 | 53 | 0 | 150 | 8000 |
| | | | | | | | | | | | | | 40235 |
| 31 | 02 | 2093 | | | 31 | 10 | 00000 | 5 | 0 | 00 | 0 | 20 | 400 |
| 31 | 02 | 2093 | | | 31 | 02 | 03000 | 7 | 1 | 00 | 0 | 30 | 630 |
| | | | | | | | | | | | | | 1250 |
| 31 | 02 | 2094 | | | 2 | 00 | 08000 | 2 | 6 | 00 | 0 | 240 | 11880 |
| | | | | | | | | | | | | | 11880 |
| 31 | 02 | 2300 | 3 | 0300 | 31 | 10 | 00001 | 2 | 6 | 10 | 0 | 160 | 38160 |
| | | | | | | | | | | | | | 38160 |

FIGURE 34

We perform all sales analysis work on one super-imposed tabulating card, rather than using many varieties of cards. We now use the eighty column card, figure thirty-five, having originally started with forty-five. The descriptions at the top of the card explain the various columns. The split state column aids us considerably in eliminating sorting and thereby obtaining a

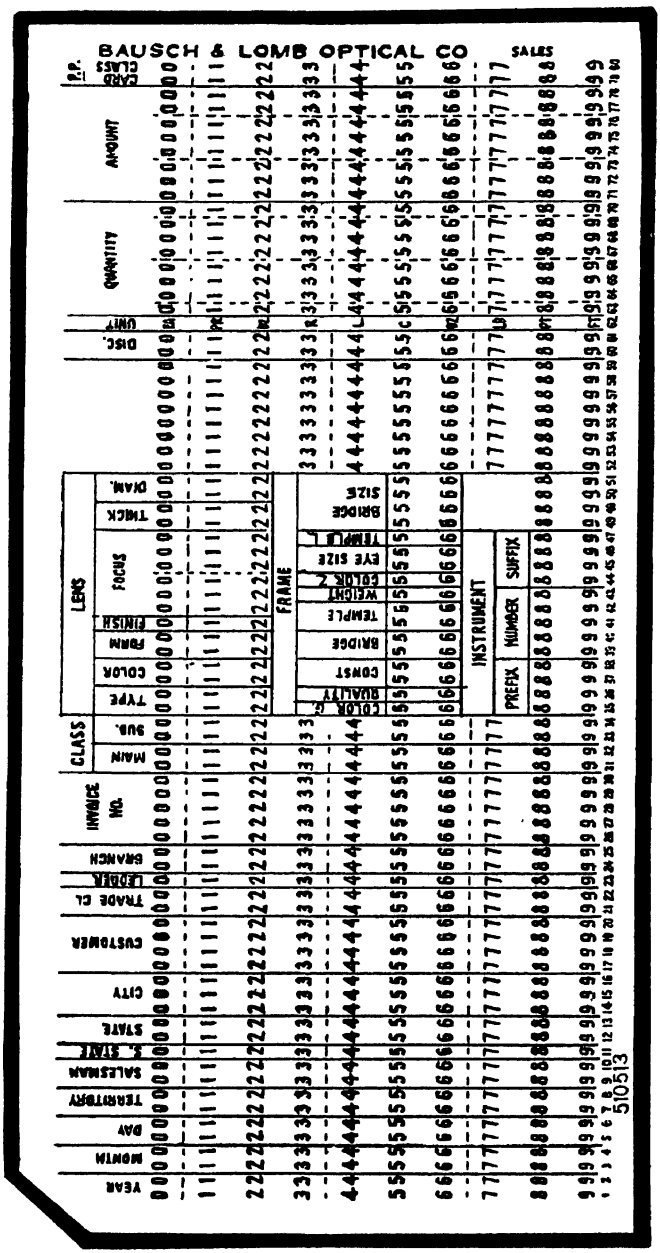

BAUSCH & LOMB OPTICAL CO
SALES
YEAR
MONTH
DAY
TERRITORY
SALESMAN
S. STATE
STATE
CITY
CUSTOMER
TRADE CL.
LEDGER
BRANCH
INVOICE NO.
CLASS
MAIN
SUB.
LENS
TYPE
COLOR
FORM
FINISH
FOCUS
TRICK
DIAM.
FRAME
COLOR 2
QUALITY
CONST
BRIDGE
TEMPLE
WEIGHT
COLOR 2
EYE SIZE
TEMPLE L
BRIDGE SIZE
INSTRUMENT
PREFIX
NUMBER
SUFFIX
DISC. UNIT
QUANTITY
AMOUNT
CARD CLASS
510513

FIGURE 35

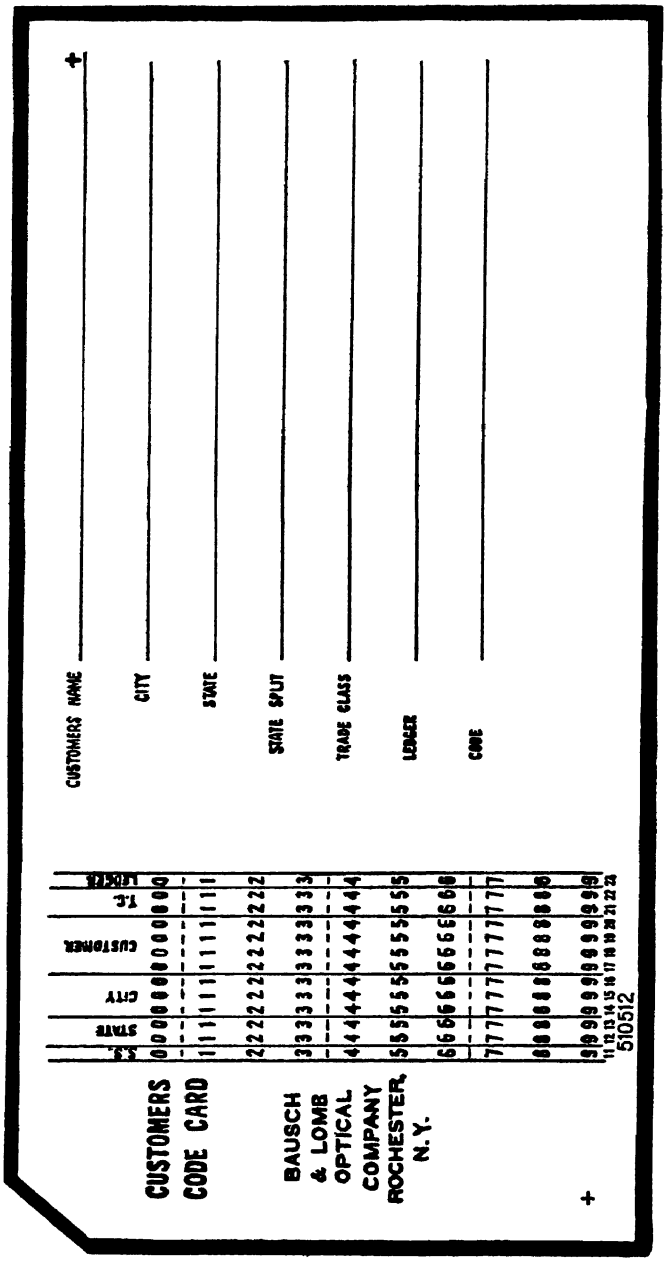

CUSTOMERS CODE CARD
BAUSCH & LOMB OPTICAL COMPANY ROCHESTER, N.Y.
CUSTOMERS NAME
CITY
STATE
STATE &PUT
TRADE CLASS
LEDGER
CODE
510512

FIGURE 36

speedy district record after our state record is completed. That is, one side of the state of Pennsylvania might be indicated to be in District A, and the other side to be in District B.

The customers' code card figure thirty-six, is used in the duplicating punches, and speeds the work up considerably when a customer has more than one item on an invoice, besides insuring accurate customer recording. There are many other forms of tabulating which we are now using, involving over seventy distinctive kinds of tabulating reports per month.

It was almost impossible for me to cover the method of budgetary control, as adapted to our company, in a brief manner. However, I sincerely thank the directors for their patient and kind attention. If I have given any practical suggestions to the Naca Company, which they may use in their efforts towards putting it on its feet, I will be very happy.

MR. JAMES: It isn't necessary for me to add any words of mine to indicate our appreciation of Mr. La Rose's talk. The very fact that on the last day of the convention this crowd who heard him this morning, and who were under no obligation to come back, did return in such large numbers, is the highest compliment they could pay to the things he said this morning, and the things they hoped he would say when he came back, and I am sure they have not been disappointed.

I feel this way about Ed La Rose; he is very sure of himself. Now, there are two classes of people in this world who are very sure of themselves. One is the fellow who just gets all pepped up with his own idea of how good he is, and he has the obsession that if he thinks it hard enough he can persuade others that it is true. The other is the fellow who bases his self-assurance on the confident knowledge that he has facts to back up all of his assertions, and I am going to go on record again, as I did this morning, in saying that I know Ed La Rose knows what he is talking about, because I have been up there and seen it. I know the degree to which they have been able to control the operations of the Bausch & Lomb Optical Company, and if I, as president, can control the operations of the Naca Company with any such degree of perfection, I am sure I am justified in asking for a vote of confidence and that you perpetuate me in the office.

We have a discussion period with regard to Mr. La Rose's and

Mr. Warren's papers, and I will ask Mr. La Rose to answer the questions pertaining to both papers.

I have this question which was sent up by John R. Morse of Cleveland: "What is the correct terminology, "sales quota" or "sales budget"? Personally, I use the sales quota to designate sales I hope to get, and sales budget for sales I have to get and will get for economic balance of operations."

Will you comment on that question, Mr. La Rose?

MR. LA ROSE: I believe you are getting away from the principles of coordinated budgeting when you use such a plan, and therefore believe that there is no such thing as a sales quota being divorced from a sales budget. It should be all one thing. You must tie in your entire operations, both at the factory and in the field, to one sales budget, in order to be successful and establish a definite knowledge of profits and cash requirements. If you intend to shoot some bogey to the salesmen, that they can't make and never will get, then you are just throwing the thing in the air. You are not getting down to standards which will produce results.

We temper the sales budget to general business conditions, to the buying power of the market, to what we think each customer in that market should buy, and consequently to what we think can and should be actually sold by the salesmen. They are taken into our confidence and given the entire set-up straight from the shoulder.

If you are going to budget on the basis of sales bogies you will soon need additional warehouses to store increased inventories, which will later cause ruin through stagnation and obsolescence.

Management works for and depends upon the budgeted profits. If they are led astray by forecasted profits, built from various sales or bogey sales quotas, and, for instance, find that their earnings are only $500,000, rather than $800,000, your budget will soon go up the flue.

MR. JAMES: I am sure another way of saying the same thing is that it is a fallacious idea that you should undertake to kid anybody in business, either to kid your salesmen into the notion that you are expecting more of them than you hope to get, any more than you should set an alarm clock a half hour ahead in order to get up at the time you expect to in the morning. If you will just

stick to facts, you can work the whole thing out intelligently, but if you start making variations, it is like ordering twice as much stationery as you need because you know they are going to cut the requisition in two for you. That way of doing business belongs to the past. You have to get clear-cut ideas of what standards are, and work toward them.

The other question is: "In budgeting sales and expenses for new products, would it not be better to put sales and expenses for new products in some form of experimental development account?" I suppose presumably to be held over and held out of profit and loss until the returns came in equal to your expectations.

MR. LA ROSE: It would take a long time to answer that question from all angles. We try to obtain, as accurately as possible, a schedule from our Engineering Department before we make the annual budget, telling us what they are going to produce in new products, so that we can plan and include them in our sales and production budgets. We also budget our complete engineering salaries and expenses by function.

We have heard of many companies who amortize their development and experimental work over the life of the product, which is perhaps due to a long term development period. However, I believe, and I think Mr. James would also tell you, that, by experience, it has been found that many companies who adopted the amortized plan have returned to the current cost basis, by reason of unabsorption.

In this day and age, it is almost essential in every case for a company to carry on with continuous experimentation and development, if they are to survive competition. Under such conditions it is believed that the cost of such work should be absorbed currently and therefore not held for absorption over a sales period. Changes in product and style are becoming so rapid that one is lucky if he can forecast sales volume a year in advance, contrary to a three, five year, or greater period as is often required for proper industrial amortization. When it comes to depletion of natural resources, which are not subject to style, such as lumber, coal, oil, etc., it is thoroughly believed that the development cost should be spread over the potential yield. In industry, our products, under present conditions, are usually not fixed for any long duration and consequently a conservative policy would be to absorb engineering

costs in current costs. Each company has its own problem to study, surrounded by individual conditions. Therefore, I would not attempt to advocate any set rule. There are many ways used for accounting for these expenditures.

In our own case, we are handling development costs on a current basis, as we feel that our development is on a very active and continuous day in and day out basis. Our product development account is broken down four ways:

1. Experimental—New product for special customer.
2. Experimental—Development of new product.
3. Research work on products.
4. Experimental—Improvement on present product.

We are actually increasing the budget for product development each year or as fast as we can obtain and properly train men particularly qualified for such work.

We not only segregate our development expenditures by class of product, but also record and develop a separate sales analysis to show the sale of both new product and engineering specials. In such a manner we are well able to measure the results of our engineering effort both on a volume and earning basis.

It might be mentioned that we have a process development account which is budgeted in advance on the basis of the departments and relative facilities to be studied. We also have a moving expense account, because we know that if we are going to make process changes, such changes will no doubt necessitate moving charges. When we set up a moving account, we staggered the management with the amount which was going into moving. They could not help but say, "Why don't you plan your move and stay that way instead of moving every six months?" As a result of bringing this item to attention, the expense was cut in half and we are now moving with the thought in mind of our future requirements on a long term basis. While facilities are now segregated according to operations, it is hoped that all moving operations within the next few years and thereafter will head towards the group plan.

N. J. BOWNE: May I ask Mr. La Rose to explain a little more in detail, the difference between the potential sales and the sales budget?

MR. LA ROSE: Please refer to figure six. The total potential market of a product might be determined to be $10,000,000. According to our potential study, as shown this morning, this total potential is next segregated to districts. An individual district would then indicate a market of $1,000,000 and our sales in that district might be $300,000 or indicate that we were getting thirty per cent of that market against an average sale throughout the country, as a whole, of forty per cent of the market.

We treat the market of each district on an individual basis, and are attempting to increase our budget each year towards a better absorption of the potential market, until we reach a volume in the industry to which we believe we are entitled. We are studying the potential market in order to determine our present and possible future sales activities.

If our potential for the district is $1,000,000, and we are now selling $300,000, we are not going to immediately raise our sales budget to $1,000,000 because we know that we certainly couldn't get all of the business. It would take many years to get it, old or new laws. However, we are going, as fast as we can, into the weaker showing districts (actual against potential) breaking the district down by trading areas, correcting sales effort, advertising, and using many other means to increase the sales budget. In districts where our budget equals the average potential absorption of the country we are usually satisfied with a normal increase in volume each year, but in districts which are below average we are raising our budget to a greater extent.

C. A. ROSENBERGER (*Supt. Administration Division, The S. S. White Dental Manufacturing Company, New York City*): What is your method of determining that increased inventory is more profitable than unabsorbed expense?

MR. LA ROSE: Please refer to figure four. When the volume of business gets down to a point where you can't correct the variable any more, or down to the fixed point, you are bound to have under-absorbed overhead. This means that, in periods of depression when you want to deal with standard costs and selling prices, and particularly with competition, your actual cost is liable to be four dollars per unit rather than three dollars per unit, all on account of the excess overhead from lowered volume. The only

way that you can then compete is to remove the excess overhead to a profit or surplus adjustment. Therefore, in some cases, if the management thoroughly believes that they can sell a standard article at a later date, they may find it very profitable, in many instances, to produce and create inventories on standard lines of products, in order to absorb an excess burden, the accumulation of which might be a severe handicap for future operations. The problem is generally in the hands of management, whose opinion should be super-imposed by good judgment and facts.

Today, or during the years of 1930 and 1931, general business has had good management, with good tools for controlling, and consequent profits and dividends. In the depression of 1920, there was an evidence of poor management, greater unemployment and no profits remaining for dividends on the investment.

MR. JAMES: Does that answer your question?

MR. ROSENBERGER: Not exactly. I wanted to know what factors you took into consideration in deciding upon the advantage of an increased inventory of stock items.

MR. LA ROSE: We would first take into consideration the fact that we wanted to give steady employment to our rather skilled labor, whom we try to keep employed throughout the entire year. If we cut down we would not only have idle factories, but would suffer unusual costs as a result of an increased turnover of labor. Our stabilization plan has already proved to be a very profitable one, as mentioned under that subject.

We would measure the benefits derived by absorbing overhead against the cost of carrying the investment in inventory, and include an estimated loss for whatever portion of the inventory that might exceed a sales risk. We would perhaps include a cost for unusual sales effort and promotion. In any case we would be extremely cautious and feel that we knew our facts before we started.

I would like to say that, to date, or during this period of depression, we have maintained the price in our industry, and have not cut wages, which is the largest element of our cost. We have made long and detailed studies of the price situation. In fact, in the spring of this year an assistant and myself spent almost four weeks locked in the directors' room, in order to give full consider-

ation to the facts of the matter when everyone was panicky on price and greater discounts.

When we were finished, we gave charts and figures to the management which showed them, for instance, that if the suggested price cut were made, a total increase in volume of approximately 100 per cent would be required to maintain the original profit. However, we also showed the effect of greater absorption of overhead through greater volume, which the salesmen said they would get with lowered prices and found that the net required increase in volume would be sixty per cent instead of 100%.

We then said, "You are now enjoying thirty per cent of the potential market. In order to retain the same profit you are now enjoying, you would have to obtain a sixty per cent volume increase, to cover the loss through the reduced price. Therefore, you will have to go out and get forty-eight per cent of the market instead of thirty per cent, and that will cost considerable in the way of advertising, sales effort, and other selling expenses if you are to reach that point". We proved to the management that they could lose five, ten, fifteen per cent or more in volume and still be better off, before they accepted the proposed price cut. Our management and its associates took the facts and stuck with us, and we have stuck to the price. Naturally, had our present costs warranted such a change, a price change would no doubt have taken place.

W. W. HENDERSON (*Assistant Treasurer, The Humphreys Manufacturing Company, Mansfield, Ohio.*): I imagine your catalogue preparation work would be quite an item. How would you expense that. Would you defer some of that charge?

MR. LA ROSE: Our experience has been that it is better to charge such items into current costs. The minute you begin to inventory or deal with reserves on items such as catalogues, price lists, or other like items, you will some day go over to the stock room and find that the so-called assets are ancient and ready for the fire box. That has been my experience with not only the above items but also with advertising forms and stationery, etc. It is much easier to expense such items and relieve your conscience in knowing, when you are throwing them out, that they have already been charged into current operations.

Many people have had many alibis to worry about because such

items were deferred. Bad habits arise, such as using perfectly good postage to ship out ancient catalogues in order to make a good inventory showing. If we are up to date, we will put out new current catalogues regularly, including all of the new products.

However, as an example, we were not so fixed in our ideas that we could not be flexible, and therefore, in October 1930, made a temporary change. We had our advertising data ready for 1931, and ordinarily we would have put some of it through in January, February, and other subsequent months. However, inasmuch as our print shop was operating on a low volume, and rather than send this work outside, it was decided that we would go ahead and produce the work in our plant in advance. For this reason we decided that we would set up and capitalize the advertising data that was to be prepared in our print shop during the last three months of 1930, and carry it as inventory at the end of 1930. In January of 1931 we would then write it off to the advertising expense of 1931. It was simply a case of giving steady employment to our own people and not wanting to bear an expense in a current year that heretofore had always fallen in a subsequent year.

During 1930 our advertising manager kicked about his budget, and said that he couldn't control the budget because the Sales Department were issuing considerable catalogues and price lists. He had formerly desired consolidation of these items with other accounts, but now realized that, only by definite segregation, could the Sales Department be openly held to live up to their budget of these items.

An advertising manager generally blames the Accounting Department when he is running over the budget by stating, some three or four months later, "We didn't get the facts from you quickly enough". So we had to convince the advertising manager that he was the one who was given an appropriated budget, and therefore it was up to him to make commitments of his investments as he went along, because the Accounting Department could only show the classified expenditures after the cost or bill was in.

Our advertising manager is now making a complete record of his commitments, and is living within his advertising budget. In the early part of last year, he got going in a small way, or was operating considerably under the budget. We went after him to spend according to his budget. He then came through with the idea that advertising was not only going to beat the depression

but would also beat us too on the basis of excessive overages, which however were practically corrected before the year ended.

These examples are merely given to show how an advertising expenditure might run without a proper commitment record, and that a proper interpretation of facts is vitally essential. I know of a company whose advertising expenditures were necessarily very seasonal, and which ran well over $20,000,000. When they budgeted these annual expenditures, the accountants and all divided them by twelve for their monthly budget. Naturally, the budget was entirely out of line. The actual performance in the early months was far better than budgeted, as the advertising expenditures at this time of year were low. The mid-year performance was much poorer than budgeted, on account of it being the peak season for advertising. Such judgment almost put the budget plan on the rocks for this company.

As an example of the control that we are obtaining today in our company through the budget, I want to tell you people that, at the end of five months, our gross profit, which runs well over a million, was within $1,567. Our net profit was actually approximately $20,000 over the budget at that time, due to a slight curtailment in administrative and advertising expenses.

MR. JAMES: I told you he would tell you facts that would take your breath away.

W. C. KOEHLER: I would like to ask Mr. La Rose why he gives his districts a complete profit and loss statement by products, on the basis that I am assuming that the district manager or the field force cannot control all items of cost and expense entering into those statements.

MR. LA ROSE: That is a good question. I did not intend to give you that impression. We have, for our control or inside management, district profit and loss statements. We do not give or send them out to the district. It is a general management problem to know as a whole what is happening in the district; whether the operations are profitable; whether more retail or jobber volume is being secured; how much should advertising be increased or decreased in the district; whether the units being sold in the district are profitable or non-profitable and many other general analyses.

We are dealing with many trades and under such conditions there are some districts which are naturally more profitable than others. Therefore, we want to know not only the districts that are more profitable, but, particularly, the trades. We were quite amazed to find a wide difference between the profit of the industrial business and that of the educational business. The educational business, of course, is handled through dealers and other channels, while the industrial volume is practically direct.

As I mentioned previously, we have segregated our sales organization so that we now have a separate organization for industrial and educational sales. While some of our men in the field, so far, are covering both the industrial and educational business, it is believed that in a few years we will have an entirely separate industrial sales force, with a complete list of products catalogued by type of industry, as we now have for the textile industry.

In mentioning catalogues, I would like to add one more thought. In the optical industry, they have a catalogue numbering system which reads like a football signal system, such as FFFS—8—QRL-MOP. Naturally, all kinds of decoding and interpretation was required, especially long descriptions when no numbers existed. Higher priced billing clerks were required for proper interpretation, higher priced cost clerks to cost the units, and higher priced stock and planning clerks, all on account of an inadequate numbering system which was believed by all to be fixed for the industry.

However, when we set up the Tabulating Department in 1927, we installed a symbolic code or numbering system of our own, similar to one which I had installed about 1922 for one of the largest power companies, the Niagara Falls Power Company, and which has since been used by others. It starts off with two digits for the main class, two digits for the sub-class, two digits for the main product, and so on down, by two digits, to the various styles and sizes. It is very well adapted to tabulating equipment making it possible to readily run any break down that may be desired for a product class, such as, by main class, sub-class, unit, style, size, etc.

At the beginning of 1931 our Engineering Department completed and issued new catalogue numbers for one entire instrument business. That is, after numbering had been tossed all over the place, we finally had convinced our management that the job belonged to our Engineering Department, where drawings, specifica-

tions, etc., belong. The catalogues being published this year contain both the old and new number. Although our salesmen thought that it would take years to educate the old trade, it was found that within a short time they were ordering by the new numbers. The old numbers will gradually be removed. We bill and tabulate with the new numbers, and no further coding is now required for any records.

MR. KOEHLER: What control information do you give to your districts?

MR. LA ROSE: We give our districts their total sales in both dollars and units, by class of product, by customer, by trade, and place all actual performances against their budget, indicating the overages or underages. We also provide a record of the district expenditures which are under the district managers control and for which he is held responsible.

E. T. ALLEN (*Swann Corporation, New York City*): How often do you change your operating standards and on how many years' study was your first standard based?

MR. LA ROSE: We are trying to keep our factory overhead standards as long as we can, using a variable account for over- or under-absorbed overhead. That is, we do not set our overhead standards on merely present conditions, but are at all times considering the future, both as to volume and future business conditions.

Our standard overhead is at least not changed during any current year. We try to keep it for several years if we can.

We are applying the point system for both direct and indirect labor control and we have a comparatively large staff of standards men who are continually looking for and making changes considering, at all times, improvements due to process changes.

It is known that the Eastman Kodak Company use an overhead standard for five years, based on an operating cycle which they believe to exist in their industry. During this period they build up an accumulated over- and un-absorbed account.

It is believed that in order to be competitive the answer is to keep your standard as long as possible, and not deal with variables. Your opening inventories, expenditures, costs, and ending inventories will thereby be clean cut.

MR. JAMES: I think you have answered only half of the question. The latter part of the question was: On how many years' study was your first overhead standard based?

MR. LA ROSE: Our first overhead standard was based on approximately a four year average. Then, as we went along, and adopted the various controls as previously described, we practically abandoned all past years' experience in determining a standard.

In our sales budget, or any of our budgets, we are no longer interested in past performance or comparisons. Our management never want to see a past year's comparison any more. What do they care about last year? What they want to do now is to live to a new standard overhead or allowed variance when the standard is now changed. All items, such as power, stock clerks, inspectors, tool repairs, supplies, etc., are set up for the new year, based entirely upon the budgeted volume of production, which in most cases varies from any prior year. Our management has removed last year comparisons from all of the books or reports, which are used at our monthly directors' meetings. That's going some, when you well know that an ordinary group of directors are not generally inclined to be as modern as we younger folks.

THOMAS J. BURKE: Are your overhead standards fixed on the direct labor basis?

MR. LA ROSE: No, not in the development of overhead. Power allowance is determined on a machine hour basis; production clerk allowances are related to the number of units; factory accounting department to total direct and indirect labor, etc.; in arriving at the final total overhead. When the final total overhead allowance is determined it is then absorbed, for accounting purposes, on the direct labor basis. For control purposes, individual analysis is made on the basis of the adopted unit of measurement for the particular item involved.

MR. BURKE: Then it varies in different departments?

MR. LA ROSE: Yes, we use standard divisional overheads. It might be mentioned that in making our decision to use direct labor to absorb overhead, in accounting, we based our conclusion

on the fact that our labor and rates were fairly consistent throughout the plant, and thereby gave us a normal base. I mention that condition on account of the fact that I realize that each industry is confronted with its own characteristic problem, and have oftentimes used machine hours, spindles, tons, etc., in making other installations.

J. H. MAC DONALD (*New York*): Exactly how do you determine normal growth?

MR. LA ROSE: As I understand your question you want to know how, in your own business, to measure the normal trend of growth. (See figure one, page 199).

Some businesses grow very fast or abruptly, and then tend to level out normally, such as Ford and Dodge Brothers. Others grow rather slowly, while others receive a sudden upward rise after years of steadiness, due to new demands, new products, new prices, new merchandising methods, etc.

As I said this morning, the rise in our own business was so sudden and abrupt that we had to adjust our computed secular trend. However, on the contrary, a computed secular trend will fully indicate your rate of growth and be found to be well worth while in cases where it gives a warning of downward tendency. Again, a normal growth study would be of consequence, in case your study of the business indicated that, at present, your volume was insufficient to break even and at the indicated rate of growth in volume, it would be good business to change policy or close.

In a personal experience with the match industry, a study of volume and trend of growth was made for the purpose of determining the number of plants required for the present and future operations. We considered very thoroughly the various indices that could be applied for measuring the market for matches. Although we knew that electric lights, electric stoves, and lighters were coming into use rapidly, it was almost a coincidence to find that the growth of match sales was absolutely parallel with the growth of population. An increased number of smokers had actually offset the losses through the use of other types of ignition.

C. C. RIGGS: I would like to make the request that Mr. La Rose tell us how he took some old items that had been in the red

for several years and brought them into the better looking color of black in the last year of depression.

MR. LA ROSE: I assume you mean the analysis of the profit and loss by products.

MR. RIGGS: I think that was it.

MR. LA ROSE: The analysis of profit and loss by class of product brought out items which covered a relatively small percentage of the total sales, or from two to five per cent, that in many cases were shrinking the profit of the class from ten to twenty or more per cent. In many cases, we convinced the management that it was better to sell out these items and discontinue them entirely.

When you are dealing with styles, and your budget analysis shows you that you can sell only 10,000 units of the possible 40,000 units you may have on hand, the Sales Department is instructed to sell those 10,000 units at the regular price and include them in the regular budget. At the end of the regular unit budget sheet, a separate listing for sales of excess or discontinued items, at perhaps job lot or scrap price, is made, in order not to carry such units over into the next year or suffer a complete loss from obsolescence. This method will help immensely in holding the Sales Department to the regular price until they have exhausted the regular budgeted quantity.

Other units on the profit and loss by product, which involved a larger percentage of the total volume, were given to the works manager and the sales managers. When they readily visualized the shrinkage that some particular group of products was causing in the net profit they earnestly dug into costs and selling prices. Perhaps the loss might be due to excessive tool costs, lack of tools, improper tools, or otherwise a case of the volume being insufficient to absorb adequate expenditures for proper tools. In cases where costs could not be corrected, the salesmen talked to the customers, explained the situation, and in many cases were able to obtain an increased price.

It is believed that the coordination, correlation, and cooperation which exists between the various department heads in our business is quite genuine. Each manager has a definite part to

play in the business, each one has his part in meeting the budget, and his duty above all is to make the business profitable.

MR. RIGGS: I am asking the method which you applied in bringing into contrast those items that had heretofore been in the red, but, by the methods which were used, were eventually brought to a profitable basis.

MR. LA ROSE: In our Cost Department we, of course, have comparative cost cards, including standard selling expense and the average price received, covering many thousands of items. Naturally, you can't very well hand these many cost cards to the management. They generally will not take the time to go through them. Therefore, we believed that if we could get a profit and loss out by sub-groups of the product classes, we could readily give the management something more compact and interesting. When they found a particular style or group in the red, they could then call for the detail cost cards. Therefore, we did not burden the management with detail, but merely gave them a nineteen page book covering the profits or losses of nineteen main product classes, by product group. At the bottom of each schedule, below the standard application, we showed other variances due to obsolescence, scrap, etc., and finally the total cost. It is so simple that a quarterly review by the management clearly pictures to them a contrast between profitable and non-profitable items against previous performance.

I might also say that in our record of product class sales, we have sub-groups to cover repair sales, to cover the sale of obsolete goods, for job lot sales, and for engineering specials. We know just what we are doing in special business volume, what our special costs are, and what we are getting in return from our engineering effort on such specials. By having a sub-group for the sale of obsolete and job lot items, we do not disturb our standard price and cost within the regular items and thereby maintain a definite comparison of regular profit or loss by product.

Those sub-groups also work out very nicely in setting up the budget for the new year. No doubt many of you are confronted with special business. We have it also. Our mirror business includes items such as various searchlight reflectors which are used on aviation fields, by the army, in the movie studios, various dental

mirrors, etc. In 1928 we were only able to budget approximately ten per cent of the mirror volume by units because the rest of it was supposedly special. The sales were subsequently analyzed by our Sales Department and our Engineering Department, and this year, 1931, we actually were able to budget ninety-two per cent of that line, simply by watching the items that were being sold, standardizing them and then getting them catalogued. Such cataloging or numbering meant that we could follow the sales and production budgets by unit. When a sales manager was under you could then tell him the exact shortage on a definite unit basis, and could accordingly readily follow production by units. When we set up the budget of a product class by units, we allow for a normal growth in special business, and estimate our expenditures for such business on an average cost basis, making a definite reserve such as machine hours, for the facility usage, for such volume.

We also consider the repair portion of each product class, which generally grows with normal business. However, in 1931 we actually increased our repair volume budget, because we realized that, during a period of depression, people send in more instruments for repair on account of not being able to buy new instruments.

MR. JAMES: I have two questions here from Mr. E. H. Taylor of Toledo: "Mr. La Rose spoke of using standards for sales expense in applying such expense to the classes of products. In the compilation of the nineteen profit and loss statements, are they carried down to net profit or only to profit from selling?"

MR. LA ROSE: The nineteen profit and loss statements are all carried to a standard gross profit, the over- or under-absorbed overhead only being shown on the consolidated profit and loss statement.

Through our budgets we are able to tell, and set a year in advance, our profit from selling at selling expense standards. We apply these selling standards to all cost estimates, and product profit and loss statements throughout the year. At the end of the year we submit two statements; one which shows the profit and loss by product class, by standard selling expense, and another which shows the result on the basis of the actual selling

expense. The latter is at present the final statement for book purposes, as we have not as yet adopted a variable adjustment to surplus for variation in selling overhead, as we are now using for manufacturing overhead.

MR. JAMES: The other question is: "Does Mr. La Rose use a standard for administrative expense and is this expense and other general expense and interest charges prorated to the twenty-one classes?"

MR. LA ROSE: Our entire administrative expense is budgeted by month, as it occurs, or on a seasonal basis, and a standard is then adopted and used throughout the year. Administrative expenses are also prorated to the nineteen classes of products.

MR. JAMES: Does that include interest charges?

MR. LA ROSE: No. Interest charges and other general cost and revenue items are carried below net profit, and are not prorated to the classes of product.

MR. JAMES: What is the basis of proration?

MR. LA ROSE: I hate to start an argument at this time. Some people are going to say prorate on cost; others on volume. I believe that it is a case of adopting a basis to fit your own distinctive operations. At any rate, all selling and administrative expenses should first be spread directly as far as possible.

We prorate our indirect expenses entirely on a volume basis for the reason that we believe a cost basis would be unfair in dealing with a variety of products, whose cost may vary from forty to eighty per cent or more. Why let the forty per cent cost item get off at a consequent low absorption of the indirect charges. It's the eighty per cent cost item that needs help.

In developing the budget of sales, cost of sales, and expense, at the beginning of the year, we are able to determine a standard of administrative and selling expenses not only to sales but also on a relative basis to cost of sales. The management then knows that if prices are being established during the year on the standard cost and expense basis, administrative and selling expenses are being absorbed as long as the budget volume is being maintained.

If a bid is made on a special article during the current year and it is believed that the original sales budget will be made, which would consequently absorb the allowed direct expense, then management only may decide to take such volume at an absorption of only the indirect expense. No one else is allowed to make such a decision. Management is provided with the total expense standard and also the standard for the indirect portion only.

MR. BURKE: Can't you budget this year's volume over last year's volume?

MR. LA ROSE: That is the way we budget volume, if general business or other conditions warrent an increase.

H. W. MAYNARD: I would like to ask Mr. La Rose how many people he has in his Accounting and Cost Departments, and of those, how many are technicians who might be called cost accountants, senior and junior, and how long it took him to build an organization to carry on successfully, under this system.

MR. LA ROSE: I came to this Company in the latter part of 1926. My employment was no doubt due to the success of professional work which had been done for them during the previous year on their amortization or war claim. It was rather a tough case to win, as it had been lost several times. It was necessary to make a complete study of the history of the business, its various operating capacities and usages in normal times. This study was made in rather fast time, or in less than three months. The fact that the results were successful might readily be indicated by an original tax liability of approximately $1,200,000 which was corrected to a refund of about $350,000. I am very glad that such results were obtained, particularly because confidence was then evidently established with those with whom I was to become associated. This is the greatest problem generally encountered when attempting to sell and install new methods of control.

The first thing that was done was to find out how much business had to be obtained to break even at present costs. When we went to the banks we then showed them what we were going to do, rather than to weep over the past.

The greatest problem found was that of required sales volume,

although it was also evident that cost reduction could subsequently take place. We wanted sales facts, and, in December of 1926, tabulating machines were installed to get the sales data as previously described. However, we did not want to lose any time in waiting for sales facts to be developed and therefore immediately set up a sales budget for 1927 based largely on past performance. We established the seasonal monthly trend of sales. By then measuring the deviation above and below the average monthly line of sales for the year we were able to budget an estimated inventory increase or decrease, from month to month.

In 1927 the management was being continually sold on the need for a complete budget plan. Every time they would call me into their office I carried my, then, little budget book with me. It was a case of making it evident to them how easily matters could be controlled by a budget plan. Finally, the management said they would like to participate in the setting up of the 1928 budget. That was all that was needed.

Today, June 1931, the management is talking about setting up the budgets for 1932 and 1933. Everybody is abiding by the 1931 standards and all expenses are being controlled. Therefore their job for 1931 is practically completed, so they can readily get busy on the 1932 budget.

The entire operating plan of the budget was completed in two years, 1927 and 1928, and in 1929 we arrived at a complete master budget for control of the entire operations. The sales facts had been started in 1927, and the research sales work, which brought out potential markets, was completed in 1930, and was a factor in the 1931 budget.

Our budget for the Factory Accounting Department is segregated divisionally, or by cost control, time control, pay control, equipment control, point, clerical, etc. This staff consists of approximately 120 people. Of this factory accounting staff we have eight technicians whom we believe are senior cost accountants. We have a total of eighteen individuals in our Accounting Departments whom we believe should be and are members of N. A. C. A.

We also have a budget for our general accounting control, which includes about ten employees; billing, about twenty; tabulating, about eighteen; accounts receivable, five people; credits, two; sales research, four people; and budgeting and methods, six.

The variety of products and consequent operating departments, as I have told you previously, is terrific. Therefore, we have an unusual quantity of cost records to maintain. It might be mentioned that we are continually dealing with 45,000 "B" values, 95,000 piece prices, and about 55,000 time tickets weekly. The total number of piece prices and "B" values are continually increasing as rapidly as rates can be applied. If I had time to continue, I thoroughly believe that I could convince you that our factory accounting cost was not excessive. Our Billing Department produces 800 bills a day, averaging ten items per bill. This results in about 200,000 sales cards per month for the Tabulating Department.

I have a secretary in my office who posts, computes, and types practically all of the financial budget records. That is, from the fifteenth to the end of the month, she posts from the master annual budget layout to the monthly budget schedule. As the actual figures are received, from the first to the fifteenth of the month, they are posted against the budget and the over or under is computed, checked, and typed. Other departments such as the tabulating, production, and factory accounting assist in preparing the actual performance of the district unit and dollar budgets, production, overhead, etc. The general manager's secretary draws and keeps the chart illustrated in figure fourteen, up to date.

The people working with me in preparing the annual budget start such work on the first of September, and continue through January to the final set-up. In the meantime, these people perform as industrial engineers, making surveys and installing new methods of procedure throughout the plant, which thereby relieves the cost of budgeting considerably, especially in view of the fact that considerable savings have been obtained on their methods work.

One of the members of our firm was interested in a comparatively small box factory. We put in a budget in less than a week, as compared to five months time for our own business. It was a jobbing business and the budget therefore was entirely on a dollar basis. This particular business was doing a volume of approximately $160,000 annually, and had a red figure every year. It didn't know what was the matter.

We went to the plant and the first thing we found out was that they had to do $250,000 of volume to break even. They had

moved from rented space to a plant of their own, which carried interest, insurance, fixed charges, etc., that were far more than the previous cost of rent. We immediately set a volume goal of $250,000 to break even. At the end of the first year of budgeting, they made their volume goal and $700 net profit. But that wouldn't pay back loans. Our sales budget for the following year was for $350,000.

I have merely given you the above example to indicate heretofore unknown results which can ordinarily be obtained through budget procedure and for the purpose of indicating the wide variance of time involved for setting up a budget to fit a small and comparatively large size industry.

Again, I would say that our budget system is not costly because we revamped our accounts along the lines of functional or organization control. Therefore, it is merely a question of taking the actual record and posting it against the budget.

One other item about budget control, by account, is that you will often find that your budget will indicate that an actual entry has been classified in error. That is, if your monthly budget shows $10,000 and the actual is $20,000, you will no doubt investigate, and perhaps find that the variance was due to classification. Therefore, in some cases your budget will be more accurate than your actual posting.

MR. JAMES: I am glad you gave him that hearty round of applause. He is well entitled to it.

Now, ladies and gentlemen of the board of directors, we have laid our complete program for reorganization before you. The question of judgment as to whether or not it will accomplish what has heretofore seemed impossible of accomplishment, which is the financial rehabilitation of this company, is one for your consideration.

I have been requested by one of the members of the board to recognize him at this time because he said he has an opinion to express on the subject. He has not informed me in advance of what that opinion will be. I am trembling for my job at the moment.

That member is Mr. C. H. Crocker of the New York Chapter. Mr. Crocker is at the present time controller of the Worthington Pump and Machinery Corporation. He is a man whose judgment

is undoubtedly sound because it is based on experience in public accounting and in industrial accounting. More than that, he has been a justice of the peace and has tried speeders. Now, I have never had any mercy at the hands of that kind of people, so I am trusting to the tender mercies of a man of whom I am suspicious in advance.

Mr. Crocker, I will recognize you at this time to hear what you have to say.

C. H. Crocker
Controller
Worthington Pump & Machinery Corporation, New York City.

For nearly three days we have listened to and discussed the report of our Officers and Directors on the financial, manufacturing and commercial position of the Naca Manufacturing Company, and to their recommendations for improvements in policies, methods and procedure in order that the company may be placed on a sound and profitable basis—these recommendations including standard costs, budgetary control, and a revision of accounting procedure.

Needless to say, these reports and recommendations have required many months of investigation, study and planning, and real work.

The scope of these reports—their logical and sound basis—their complete coverage of the five basic sub-divisions into which efficient management divides business from an administrative standpoint, indicate that the president has gathered together an executive organization of wide and diversified experience and one which, under his able direction, should, in due time and with the improved economic conditions which must, in the reasonably near future, come to this country, produce a profit and distribution which will be satisfactory to the stockholders, directors and officers.

The basic sub-divisions into which expert management divides administrative activities may be stated as:

Financial
Selling—including sales forecast and publicity
Production—what to make
Manufacturing—how to make it
Accounting—including budgetary control and cost information

Before we pass upon the reports submitted, which we shall hereafter often refer to as the "Management Plan", we think it important in this executive session of the board to briefly summarize the various divisions of the plan and its related recommendations to ascertain

First: Does it completely cover the five basic sub-divisions of business administration?

The management plan appears to cover all phases of the business in a most logical way; we have heard from the sales manager as to selling methods, personnel and compensation, and he has also presented a sales forecast. This sales forecast has been used as a basis for the Production Department to determine "what to make". The Manufacturing Department has reported on the physical condition of the machinery and equipment and its adaptability to the production schedule, which in turn is based upon the sales forecast. The Accounting Division has submitted a system of budgetary control and its related Cost Department has submitted a standard cost system for the control of labor, material and burden, based upon the previously mentioned sales forecast and production schedule.

While we have not directly had a report from the treasurer, the reports of the other Officers indicate that the operations of the company should result in a profit. We do feel, however, that in the near future the president should have the treasurer submit a forecast of the cash position of the company under given conditions and with special consideration as to its ability to handle the business which is contemplated under the sales forecast and production schedule. In this connection, it is very interesting to note that the control systems recommended should keep the inventory at a minimum and this, of course, is naturally of great assistance to the financial side of the situation.

While the sales manager has not gone into detail in connection with his publicity program, we are quite sure that in due course of time, such a program will be submitted on a basis commensurate with the sales forecast and the financial position of the company and with due regard to economic conditions and competitive possibilities. Also, let me emphasize the advisability of salesmen and all the other employees understanding and using publicity matter.

Second: Do the various sub-division reports and recommendations coordinate into a sound and logical management plan as a whole?

There is no question but that coordination and cooperation are essential to the success of any company or any organization and to those sports which require team work for their success. I am sure that you will agree with me that a star football carrier does not get very far in the long run without proper team interference and assistance. It is evident, of course, to all of us that if the Production Department were to proceed to produce an inventory without regard to the financial position of the company or its sales policies, that losses and not profits would ensue. An examination of the management plan submitted indicates that this feature of cooperation and coordination has been given due consideration, as illustrated by the fact that we have seen that the production schedule harmonizes with the sales forecast and reconciles with the cost control and into the budgetary control. This is real team work and spells success.

Third: Will the plan, with due diligence and ability on the part of the officers, executives and directors, produce a profit commensurate with the capital and brain investment?

Having noted that the plan covers the five basic sub-divisions of business administration; having noted that these plans cooperate and coordinate into a sound and logical plan as a whole; having due confidence in the sales forecast and in the ability of the Sales Department to meet this forecast; having due faith in the abilty of the business of the United States of America to overcome present economic difficulties, I think that we can all look forward to the future with the assurance that under the able leadership of our president and supporting officers and executives, the plan will produce a profit commensurate with the capital and brain investment and in this connection, it is very interesting to note that the capital of this company has been conservatively stated. I do not mean to insinuate that the brain investment of this company or of this organization is conservatively stated. I am quite willing to leave the appraisement of the brain valuation to your own good judgment. We think that another element which should make us

optimistic as to future profit is the reputation of this company and the usefulness and merit of its product.

Fourth: Will the Plan stand the test of present and future economic conditions and for a sufficient period of time to warrant the continuance of stockholders' investment?

In the light of the ability of this company to meet changing conditions as evidenced by this meeting, I think that we can safely state that the prospect is decidedly optimistic and that the plan will stand the test of present and future economic conditions and certainly the continuance of the business with the prospects now before us is much more logical than would be an attempt at liquidation, which could only result in a substantial loss.

Fifth: Does the plan provide for real service to the customer—a service equal to or better than the average competitor offers?

Henry Ford has stated "that which is less serviceable is at the mercy of that which is more serviceable". We, or any other company or organization cannot be successful unless we are prepared to render service with a capital "S". Reports which we have listened to indicate that the officers have this question of service in mind. We do not think it important to point out that this is a question which must be given constant executive consideration.

Gentlemen, we believe that the summary indicates that the management plan submitted does provide:

First: That the basic sub-divisions of business administration have been thoroughly and soundly covered.

Second: That coordination and cooperation, which is absolutely essential to success, has been provided for—but let me add at this time, that the president will need to watch and guard this subject constantly.

Third: A sound and economic basis. With proper administration the company will be equipped to meet present and changing economic conditions in a most satisfactory and profitable manner.

Fourth: Service to customers with profit to the company.

Before offering a resolution for adoption and approval of the

plan, however, I think it important to refer briefly to certain related items.

The loyalty and earnest efforts of your officers—your organization—merits our hearty approval and appreciation and should be rewarded by our renewed attendance at meetings throughout the coming year. Nothing is more discouraging to your officers and directors than slim attendance at meetings or the declining of committee duties and I am sure that this plan—and the plan of our organization—warrants the statement that the Naca Company —and the N.A.C.A.—are due for a year of wonderful progress. We have the knowledge, the ability, and the desire to be of service, and of real service, to business in general and to your own company in particular.

I am confident that every Chapter can advantageously adopt the principles of the plan presented to this convention as a model to make each and every chapter a profitable one for its members, for the accounting and cost profession, and for business in general.

I am convinced that the plan and its presentation have clearly demonstrated that our cost acccountants have the ability, knowledge and desire to be of service to business and it behooves us all to so model our reports and recommendations that the profession of cost accounting may continue to progress in importance in all business executive councils. Great progress has been made in recent years, thanks, in a large measure, to the N.A.C.A. and to its able administration.

In the Prologue of this meeting, our young cost accountant said, "I do not feel that I have been getting the whole-hearted cooperation from our controller"—but in the management plan now submitted, the cause of this lack of cooperation has been eliminated, for in his report to the board of directors on Tuesday, the cost accountant outlined the cost system which coordinates cost reports with production, labor, material, burden and inventory. This indicates an important advancement in the duties and opportunities of a cost accountant.

Allow me to emphasize this matter of cooperation and coordination—it is important—and properly given and received, greatly increases the sphere of usefulness and accomplishment of the cost accountant. The Holy Bible teaches us to cast our bread upon the waters and it is surprising under this scheme of real cooperation and coordination, how an accountant or accounting

department, can give up some of its alleged prorogatives in the spirit of cooperation and yet gain in standing, in service and in reputation.

We have had our era of mass production and low cost, but today another real problem is in the reduction and control of selling and distribution cost. The management plan, which has been submitted, recognizes this situation—and the N.A.C.A. has also recognized this situation—and I strongly recommend that the various chapters of the N.A.C.A. give this subject their further serious consideration—as it presents an opportunity for continuous expansion and growth, for further service to business with a caiptal "S".

At this time, let me state that, in instances where a standard cost system is the logical installation, it does not profess to be a cure-all—a logical and sound plan which comprehends the five basic conditions of business administration, and which compels co-operation and coordination, and which provides for reduction in selling and distribution expenses, is the logical approach to the solution of many necessary business rehabilitations, but we do know that in many cases the standard cost system is of great assistance in attaining these objectives.

In any event, a budgetary control system is imperative in order that the executive officers may at all times have the business under control and in conformity with economic and competitive conditions.

I ask you to remember that your profession entitles you to an executive position and especially so if you can bring clear and interpretive statements out of the mass of details which it is necessary for you to record and assemble. Let every man leave this room resolved to increase his service to the company which he serves, to prepare intelligent and sound interpretive statements which will cause the directors and their executive officers to recognize that in higher cost accounting lies a valuable instrument to meet present and future economic conditions.

It seems to me that this is an appropriate time to refer to the able manner in which our president, Mr. James has planned and conducted this meeting and to express our great appreciation and respect for him.

In conclusion, gentlemen, I offer for your consideration the following resolution:

THAT WE, THE BOARD OF DIRECTORS OF THE NACA COMPANY, AFTER DUE CONSIDERATION OF THE PLAN SUBMITTED BY THE OFFICERS OF THE COMPANY—ALL MEMBERS AND ACTIVE WORKERS IN THE N.A.C.A.—HEARTILY APPROVE OF THE MANAGEMENT PLAN AND HEREBY DECLARE IT EFFECTIVE, AND THE PRESIDENT IS DIRECTED TO IMMEDIATELY PROCEED WITH ITS INSTALLATION.

IT IS UNDERSTOOD THAT THE PLAN FOR THIS NACA COMPANY INCLUDES THE ADOPTION OF STANDARD COSTS, SALES FORECASTS, BUDGETARY CONTROL, AND A REVISION OF ACCOUNTING PROCEDURE.

AND IT IS FURTHER RESOLVED THAT THE BOARD OF DIRECTORS DESIRE TO EXPRESS THEIR APPRECIATION OF THE LOYALTY AND ABILITY OF THE OFFICERS OF THE NACA COMPANY AND THE OFFICERS AND DIRECTORS OF THE N.A.C.A. FOR THE SPLENDID AND CONSTRUCTIVE PLAN WHICH HAS BEEN SUBMITTED FOR THE REHABILITATION OF THE NACA COMPANY AND IT IS HOPED THAT THE DIRECTORS OF THIS COMPANY WILL GIVE DUE PUBLICITY TO THIS PLAN IN THEIR OWN RESPECTIVE COMPANIES AND CHAPTERS.

MR. JAMES: Well, Mr. Crocker, I thank you on behalf of myself and my fellow officers for your expression of confidence, and I assure you if this resolution is adopted we will all take very seriously to heart the constructive suggestions you have made for our further efforts in the affairs of this company. Is there a second to this resolution? . . . . The resolution was seconded by Mr. Kaplan.

Mr. George M. Arisman, the assistant controller of the Armstrong Cork Company, has asked to be recognized to talk on this resolution. Mr. Arisman has assured me that in his own company, the makers of the famous Armstrong linoleum, the application of these same principles has produced a profit in the face of a thirty-one per cent loss in sales. If Mr. Arisman can tell us how that has been accomplished, briefly, it will be a valuable contribution to the discussion of this resolution.

I will recognize Mr. Arisman at this time.

GEORGE M. ARISMAN
Assistant Controller,
Armstrong Cork Company, Lancaster, Pa.

I would like to ask you a question. I wonder if Ed La Rose would mind if I let you in on a little secret. About a year or a year and a half ago, I spent a day with Mr. La Rose in his office in Rochester, and he made me dizzy on that day and I have been dizzy ever since, and I hope to be dizzy for some time to come.

Mr. La Rose had a very fine budgetary control system in his company at Rochester, and we have in some measure adopted some of the same principles he was using up there. We are at present working on standard costs and budgetary control and we are in a position where we feel a great deal more comfortable about the conditions than we did one year ago.

The balance sheet shorn of all alibis is the basis for measuring the results of management. The Naca Manufacturing Company balance sheet shows vividly that the management is in trouble. The discussions of the past three days have told us where the trouble is and very definitely and ably developed plans for rectifying these conditions have been presented to us by our operating organization and their associates.

Our president, Mr. James, has acceeded the fact that he was in trouble and did not know what to do, but was broad-minded enough as a chief executive of the corporation to allow his well-equipped organization to assume the task of placing the Naca Manufacturing Company in a position where its balance sheet will reflect a proper, healthy and satisfactory condition.

The first member of our operating organization to present his plans, Dr. Charles Reitell, the cost accountant, showed us how, by means of standard costs and expense budgets, control would be had for material, labor and burden so that costs would be commensurate with the volume of production based on sales and inventory requirements. This able young cost accountant expressed particularly the necessity and the importance of setting up standard costs and expense budget control according to the proper source of the item, the function, the operation and the point of responsibility. He has given you a very clear conception of the requirements from the cost accountant in order that he may not be found guilty of breaking his responsibility or duty to the Naca Manufacturing Company.

Our cost accountant's views and plans for the Naca Manufacturing Company are not mythical, for such authorities as Mr. Thomas B. Frank, Treasurer of the Cincinnati Planer Company and Mr. Albert E. Grover, Cost Consultant of National Machine Tool Builders Association and Mr. E. J. Goldschmidt, Controller of the Export Division of the American Rolling Mills Corporation have approved them. These men have further demonstrated to you through the presentation of accepted actual practice and experience, sufficient cases of where control is exercised by means of standard costs and expense budgets to convince us beyond a doubt that our cost accountant has a practical and workable plan for cost control from which it will be possible for our management to fix prices to meet competition, which prices will allow the required profit over costs.

The production manager, Mr. Irvin Gerofski, presented clearly, from a practical viewpoint, his plans for determining production standards. You will agree with me that his plans are basic, practical and workable. Mr. Gerofski's main theme was based on methods study as the first requisite in setting cost standards and the scientific fixing of rates on this base, the ultimate and desired result as a standard.

Here again our President, Mr. James, went outside of the organization in order to secure a man in the person of Mr. C. W. Avery, President of the Murray Body Corporation, in order to prove to you that your production manager, Mr. Gerofski, was not putting forth a plan which was a theoretical, hypothetical panacea for the ills of the Production Department. Mr. Avery presented to you in a most interesting and convincing manner that proper production analysis, development, engineering and planning were required in order to put your corporation or any corporation on a profit-making basis. Further, Mr. Avery proved that these requisites of economic production were necessary and practical beyond question by reciting many actual conditions and experiences where they have been used in effecting economies in order to reduce costs, meet competition and retain a required profit for the dividends to the stockholder and that portion of profit to which the business is entitled as an addition to surplus for expansion, years of depression and other contingencies.

Mr. R. H. Dick, the general sales manager of the Naca Manufacturing Company, presented to us plans for building up sales

volume, decreasing sales resistance and securing better prices for our products, through careful sales planning based on market analysis, product study, sales forecasts, sales expense budgets, proper territorial planning and many other ways by means of which the required sales income may be secured on a profitable basis. His plans are practical, workable and will produce the desired result.

Again, in order to prove to us that these sales plans are practical, workable and will produce the desired result, Mr. G. V. Christie, Jr., general sales manager of the Gifford-Wood Company told us that economies had been effected and controlled by means of sales expense budgets, that sales quotas have been set and actually attained, that compensation plans for salesmen have been successfully applied and, last but not least, that his corporation is out of the rut of pre-depression methods, through the application of these and similar solutions to their sales problems and they are on the way to better sales management, profits and prosperity.

We may say, "That is one company but ours is different". Mr. Dick had a second associate, Mr. R. H. Knowland, vice-president and general manager of the Bigelow-Sanford Carpet Company, present to us his sales operating plans which he has used and is continuing to use for securing the desired volume of business for his corporation. While Mr. Knowland's corporation is in a different industry from that of Mr. Christie he has applied the same sales planning principles as Mr. Christie uses and our sales manager, Mr. Dick, proposes to use for our company. The Bigelow-Sanford Carpet Company actually does the things with success which Mr. Dick is recommending to us. Mr. Knowland stressed the importance of the practice of conducting sales forecasts and cost information in respect to price fixing and he also pointed out many other uses for costs and the cost accountant in respect to successful sales planning and sales problems. In short, he has made valuable use of standard costs as set up by his cost accountant.

You have heard plans presented to you by our controller, Mr. Robert E. Warren, by means of which he will be able to effectively record and present, through accounting, the results of management in our corporation. Mr. Warren stated clearly his conception of the necessary type and functions of our operating organization and with this in mind, he made clear to us that the basic principle of control and, from it, effective management rests on having proper standards and their use by our management and that the

home and put to work. And if we have accomplished that, we have accomplished, I think, more than all the meetings of all the financial people in the world could ever have, because we are going to start the wheels going again.

I would like to have Dick Fletcher come up here for just a moment.

. . . Mr. F. R. Fletcher came to the platform . . .

I made my remarks last night and said what I thought of this Committee and the work they had done. It is one of the grandest pieces of work ever done in organizing and laying out a program.

I am not going to ask Grant to come up here, because I told you last night, too, what we thought of Grant Lohnes.

And as for Charlie James, it goes without saying that it isn't necessary for me to tell you how much we appreciate him and his work. He has sat up here for three days and worked hard. He is completely fagged. It is hard work, gentlemen, and I know we all appreciate it. So I would just like to have a hand for president James.

. . . The audience arose and applauded . . .

MR. JAMES: I will take that as an expression of friendship as well as appreciation.

CHAIRMAN COLLINS: And now this meeting stands adjourned, the winding up of our Twelfth Annual Conference.

Adjournment.